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THE REACTION AGAINST RAILWAY BAITING.

A year ago at just about this time state legislatures without number, but especially at the West and South, were closing sessions or had just closed them, which had been a kind of saturnalia of railway baiting. The railways had been attacked at almost every point open to statute or believed to be so. Capitalization, rates, demurrage, rights and wrongs of passengers and employees, and a medley of other subjects all dropped into the law-making hoppers, usually to be ground out into some form of law. And the general assault came too, strikingly enough, at a period when railway earnings were dropping fast under the impact of the business depression, and when the railway situation called for leniency rather than severity. To state attack federal attack was added. Indeed impartial history will probably find that the epoch of railway baiting of 1908 and a little earlier had its primal spur at the federal capital and the example of National authority was reflected downward on that of the constituent states.

The change during the past six months has been impressive. Where before was action is now reaction or, at least, cessation. In a number of western states, albeit on a small scale, there has been distinct recession; in almost none renewal or continuance of the old anti-railway asperity. Even in Massachusetts where the anti-monopoly cry, focussed against the Boston & Maine merger, reached a pitch of frenzy there has been subsidence into sobriety, with the governor of the state himself taking an active hand in a measure of compromise. Deep and broad aftermaths of last year's legislation of course remain; the state railroad commissions and the courts, federal and state, as in the Missouri rate case, have been loaded and overloaded with interpretations and legal applications of the new statutes. The end is not yet and cases not a few must probably go up to the federal supreme court. But the tempermanental reaction or stagnation in railway baiting remains an impressive and interesting as well as cheering study.

The temperamental change at Washington and the substitution of admonition for the "big stick" must obviously not be overlooked in the theory of reactionary causations. Indeed it stands in the foreground of causes, yet is apt to be underated by those not aware how far the federal tentacles reach, how every federal attorney takes his cue from the national department of justice and how his influence and acts swerve local feeling. But, passing by all federal aspects of the change, it strikes quite as deeply into a fundamental law of popular feeling. Quick action and reaction are the traits of a self-governing people—the flush, the full, the ebb of temper, the flash that almost never grows to the continuous flame. The anti-railway wave is now subsiding just as the granger movement starting in 1873, starting too in a post-panic period, went down, though after a larger and broader, if less violent, sweep than the movement of 1908. Movements, uprisings of this kind in our civic life reach other questions than those of the railways. They may be good or bad, may be reformative or arrant demagogism, may range from ultra selfishness up to the betterment of Philadelphia politics. But they subside ere long into what the modern writers are fond of calling "individualism"—of which one form in the railway case is the good crops and prices in the west, where the farmer has begun to go to market in his automobile.

Another element in the reaction favorable to the steam railways must also be counted in. Sharp as was the attack of 1908 upon them it had to distribute its forces. The somewhat analogous granger uprising of 1873 was concentrated on the steam lines. There were no industrial trusts, no street railway combinations to divide it. The anti-trust movement and the Sherman act have involved railway questions too in their broad reach, and to that extent have been prejudicial to railway interests. But let us imagine for a moment, if we can, what would have been the result during the last two years had all the anti-trust ardor and the civic emotions roused by the street railway scandals of New York City—and there are others—been centered on the steam railways alone. There is a sense, and a large sense, in which these extraneous interests under attack have served the steam railways as lightning rods.

The look into the future has, of course, its dubious spots. As a sequel of the year of railway baiting an enormous mass of statutes, taking the country through, has been laid upon the railway corporations. Some of it will stand in the courts; much of it will fall, and especially that part of it which bears upon confiscatory rates. Some of it, notably taxation statutes, is serious; some of it petty. It may be a considerable length of time before the grains of justice are winnowed from the chaff of prejudice, selfishness, "politics" and demagogism. But whatever the consequences of past anti-railway legislation recurrent prosperity will go far to overcome them and the present reaction against such law making stands as a telling and encouraging fact.

PECULATIONS OF CONDUCTORS.

According to the newspapers two prominent western roads which have never before employed "train auditors" are now putting them on, "with a view to preventing the alleged peculations of the conductors." We do not suppose that any officer of the roads named has actually used that ugly word, at least not in the presence of the reporters, and officially; but there is some gain in having such a frank explanation, even unofficially, and at second hand, and we modestly attribute a part of the credit for this improvement to our article of two weeks ago! At any rate our setting forth of the absurdity of the declaration, so often made, officially and unofficially, that the conductors are relieved of a part of their work because they have not time to attend to the whole of it properly, was only a recognition of a situation which is universally acknowledged. The reason that we commend frankness is that so many railway officers all over the country speak frankly on this subject in private. On an important matter of this kind we can see no advantage in keeping up such a wide difference between what is said and what is thought. Many railway managers of long experience use a shorter and uglier word, and do not say "alleged"; and there is no use in denying a well-known situation—even where there is not enough satisfactory proof of detail facts.

And a railway manager can be entirely frank in this matter without casting reflections on honest conductors; any more than a bank reflects on the character of its honest employees by keeping a close watch for dishonest ones. The problem before the railway manager who does not want to have two conductors on a train is comparatively simple; not so simple as in the case of bank cashiers and station agents, yet simple enough to make inaction inexcusable. We do not say that the complete cure of the evil is in all cases simple; but it is a simple question to decide what to do. When a single company estimates that it has made a half-million dollars in a year by putting collectors on its trains it behooves every manager at least to know all that he can about the actual situation on his own road.

And this suggests one of the first principles in the matter; the principle that the superintendent is bound to maintain a high standard of efficiency even at high cost. One prominent superintendent said recently that in certain situations he had spent, to remedy the non-collection of fares, more money than the recovered fares themselves amounted to. The need of training the public to be honest with the carrier is not to be ignored. It is a duty to see that the passengers pay, aside from the question whether the conductor does or does not turn the money over to his employer. The road that does its utmost at this point may know a good deal more about the accuracy of its conductors' work than is now known on most roads. "Accuracy" is another word to bear in mind. The need of proving the accuracy of a conductor's cash fare collections justifies the most careful checking of his work, assuming that he is honest. On one important road a number of years ago a great change was effected in the work of the conductors as a whole simply by reining them up in non-fiduciary matters. Spotters were employed, in the ordinary way—though they were unusually reliable and efficient men—and the confidential reports thus secured and with which the superintendent subsequently confronted the conductors were so detailed, accurate and convincing that each conductor acknowledged their substantial fairness as statements of fact. There is no doubt that some stealing was stopped. In short, strict inspection, maintained for the purpose of correcting all kinds of negligence and misconduct, will have its effect on the cash collecting.

Another important element in the businesslike collection of tickets and fares on trains is to have the work supervised by men who have been brought up in that kind of work. One of the elements of reasonableness in the employment of "train auditors" is that men can be employed for the work who have had experience and training in an auditor's office or in some kind of accounting work. Some of the eastern roads, of which the Pennsylvania was the pioneer, have recognized this principle in the employment of "ticket receivers"—men stationed at division termini to receive the collections of conductors immediately on the termination of each run. To the conductor brought up in freight-train service the accurate keeping of accounts of any kind is often an irksome task, and frequent admonition, instruction and even radical correction may always be a necessity, if his work is to be classed as satisfactory. Checking a conductor's accounts within two or three hours after the end of the trip is far different from making an investigation a week afterwards. Officers of the Pennsylvania put a high value on their ticket-receiver system. It might be said that office men should be made conductors; but men with freight train experience are always going to be valuable as passenger conductors, if they can be otherwise well qualified, and it is worth while to do everything practicable to utilize them.

In saying that the superintendent's duty in this matter is a simple one we are not blind to the possibility that he may be obliged to declare war. Charles Paine, who was a model superintendent, had but one formula in dealing with untrustworthy conductors on the Lake Shore & Michigan Southern. Having concluded that a conductor did not make satisfactory returns for a given train, he told him just that and nothing more; and then discharged him. But the discharge was final. There is no use in blinking the fact that nowadays that kind of action requires grit. The superintendent must know his inspectors; he must know his conductors' records thoroughly, and must have treated them so fairly that they can have no ground for appealing to the president of the road and there stabbing him (the superintendent); must have strict regulations and be prepared to discharge men for dischargeable causes uninfluenced by anything not connected with the problem in hand. Many conductors of years' standing might be discharged for habitual discourtesy, with great potential advantage to the public and the company, and with mighty little injustice to the conductor.

As we suggested in our former article, the conductors' brotherhood ought to take a lively interest in denouncing dishonesty and in establishing a high standard of honor in the railway service. It seems as though there ought to be somewhere, on some road, the three elements necessary for a "demonstration" which would give this subject the illumination that it needs: (1) A courageous superintendent, backed up by (2) an equally vigorous general manager; (3) a conductors' committee willing to co-operate in an attempt to establish businesslike conditions in fare-collecting. But, as we have just suggested, there is no use in starting such a campaign except with the determination and the resources to transform the whole business of dealing with passengers on trains into the most perfect system that brains and money can produce.

It is a great pity that the "pay as you enter" plan cannot be adopted on railways generally. No financial business, outside of a corrupt political organization, was ever managed in such unbusinesslike ways as prevail on American passenger trains. One of the best experiments ever made was that of the Alton road a few years ago when for a time every passenger was made to buy a ticket, even if the train had to be held while he went to get it. One minor division of the Big Four was treated to the same reform. It would be well worth while to investigate the history of those trials and see if their abandonment was surely justified. The street railways in New York and other cities have made thousands of dollars by the "pay as you enter" system; and although the stealings of conductors have been great, if we may accept the unanimous testimony of those who have most carefully studied the situation, the losses by passengers' evasion

of the conductor and neglect to pay when not asked, have been even greater. At least that is the testimony of one prominent street railway officer. As to one glaring self-inflicted fraud—allowing another road to cheat you by careless or doctored reports of car service—the railways have purged themselves by adopting the per diem system of paying for borrowed cars; it is time that this other voluntary self-bleeding process be attacked.

THE NEW DUTCH PASSENGER TARIFF.

There are two railways in Holland which heretofore have had each a distinct passenger tariff. The Holland Railway company charges a regular rate per mile, with reductions for return tickets; the Netherland State Railway Co. has a zone tariff, in which the rates per mile are reduced for every successive 50 kilometers (31 miles). In the following statements the rates are given in Dutch *cents*, one of which is just about 0.4 of one of our cents.

Now the Holland Railway rates are, per kilometer, 5, 3¾ and 2½ such cents for single fare for the three classes respectively, and 6, 4½ and 3 cents for round-trip tickets. This in our currency is 3.22, 2.42 and 1.61 cents for single fares and 3.86, 2.90 and 1.93 cents for return tickets, these latter costing only one-sixth more than the single tickets. The Netherland company charges the same as the Holland company for single fares for the first 50 kilometers, 8, 6 and 4 Dutch cents for return tickets within that distance; but for greater distance the fares grow lower, as follows, in Dutch cents:

	Single ride.			Go and return		
Class	1st.	2d.	3d.	1st.	2d.	3d.
Up to 50 km.....	5	3¾	2½	8	6	4
51 " 100 "	4	3.2	2	6	4½	3
101 " 150 "	3½	2.8	1.75	5	3.75	2.5
151 " 200 "	3¼	2.6	1⅝	4½	3⅜	2.25
200 and over	3	2.4	1½	4	3	2

This makes the fares for 200 kilometers or more very low, though you cannot ride very much further without running out of Holland, which is not as big as Maryland. The fares are at the rate of 1.93 American cents per mile, first-class, 1.54 second and 0.97 third-class, and 2.58, 1.93 and 1.29 cents respectively for round-trip tickets. The two companies have now agreed upon a common tariff, the basis of which is 3.25 Dutch cents per kilometer for the first-class, 2.45 for the second, and 1.625 for the third, which is slightly more than one-half the round-trip rates on the Holland company's lines and round-trip tickets are abolished. There is, however, provision made for the few distances of more than 200 kilometers, and there are some other modifications. This is a very great reduction on the single-trip tickets, which, however, are but a small part of the whole. There are some trips that will cost more than by the old rates, but generally there is a reduction, and the tariff as a whole appears to be lower than any other in Europe, which is the more notable because the canals of Holland carry most of the freight and the railways consequently depend more on the passenger traffic.

The new tariff had been submitted to the government authorities at the latest report and had not yet gone into effect.

NEW PUBLICATIONS.

Der Preussische Landeseisenbahnrat in den ersten fünfundzwanzig Jahren seiner Tatigkeit (1883-1908). Berlin: Carl Heymanns Verlag. 1908.

This memorial tells how the government in Prussia has kept and keeps in touch with the changing demands and requirements of the public in reference to the service rendered by the railways, which, as is known, are owned and operated almost entirely by the state.

When the bill authorizing the state to acquire railways was being considered (1879-80), the concurrence of the house of delegates was made dependent on the furnishing of satisfactory guarantees that the state would operate them in a manner to serve the economic interests of the country. To satisfy this demand a law was agreed to establishing "railway councils," i.e., commissions composed of members representing the commercial, industrial and agricultural interests of the country. This law went into effect Jan. 1, 1883, and by it were created district railway councils and a central railway council (*Landeseisenbahnrat*).

The territory of the Prussian railways is divided for administrative purposes into districts. For each of these districts (in some cases for several) a railway council was established composed of representatives and of alternates chosen for a term of three years by the chambers of commerce, the associations of merchants, those of agriculture and those of other activities in the district. It must meet at least twice a year, may appoint a permanent committee, and is to be heard on all matters concerned with railway transportation in its district.

The central railway council was originally composed of a presiding officer with an alternate, appointed by the king, and of forty members chosen for a term of three years, ten of which were appointed by various ministers and thirty chosen by the district councils in a manner prescribed by law. On account of the increase of railway districts, the number of members elected by the districts has increased. For each member there is an alternate in case of temporary incapacity. To expedite work a permanent committee must be appointed to report matter requiring attention. There must be submitted for the opinion of the council all passenger and freight rates, rulings as to the application of rates, questions concerning exceptional and differential rates, and proposals for changes in operating and railway policing in so far as they are not of a technical character. It may be called on to give its opinion on questions of importance and may make suggestions to the minister of public works or ask him for information. It is made the duty of the minister of public works to report regularly to the Landtag the result of deliberations of the central railway council and submit the passenger and freight rates in force.

It will be noted that the object of this system of advisory councils is to determine by amicable discussion between the railway authorities and the representatives of the public, the traffic regulations and rates that will best meet the needs of the country.

The example of Prussia has been followed by the other German states and similar bodies now exist in most of the countries of continental Europe. The success of these councils and the importance that traffic on the internal waterways has assumed, has led the Prussian government to establish advisory councils for waterways on lines similar to those for railways.

The memorial, after a short history of the development of the railway council, gives a summary of the work it has accomplished. The text of the law creating the railway council and subsequent modifications is also given. E. F. E.

Foundry Practice. By James M. Tate and Melvin O. Stone. New York: John Wiley & Sons. 234 pages; 5 in. x 7 in.; 112 illustrations; cloth. Price, $2.

This book was written in order to supplement the shop practice at the University of Minnesota with class room work that would deal directly with the details of the manual instruction, and it is in the close attention given to these details that the book excels. Ordinarily the text-book on foundry or any other shop practice takes it for granted, unconsciously perhaps, that the reader is more or less, usually more, familiar with the processes to be described, with the result that many minor, but none the less important, details are overlooked or barely mentioned. The authors of this book have started out with the position of the ideal instructor that the student is absolutely ignorant and somewhat stupid, and that, therefore, every step must be made abnormally clear and simple. Certainly this has been done in the opening chap-

ter where every minute movement to be taken in the making of a mold is described, clearly, concisely and simply; and these instructions are supplemented by illustrations to make the meaning unmistakable. It starts in with placing the turnover board on the sand and the proper placing of the pattern on the board, and so on until the cope is lifted, the pattern drawn and the mold closed.

Then in dealing with the more intricate problems of the work, it gives the reason for things, and in this teaching of the whys and wherefores it will serve to impress the value of little things upon the student or apprentice in a way that a mere rule of direction can never do. It tells why venting is necessary and why it should be done in certain ways. It explains the effect of uneven ramming, and why that effect is produced. It explains the reason for the variation in core-making and why different sands have different values. And so it is of value to the beginner and the apprentice. It is not a book for the skilled foundryman, because it does not enter into the wide field of scientific foundry practice, though there are undoubtedly many foremen who could read it with profit to themselves and their employees; but it is essentially a book of instruction, and, as such, is well worthy the attention of every student and apprentice. For, though, to the latter, when he has advanced a little, it may seem to deal with simple things; it will do him good to read of these simple things and impress it on his mind.

In its scope it touches upon green and dry sand molding, the molder's tools, cores and core-making, cupola practice, chilled, malleable and steel castings, brass founding and cast-iron alloys, and closes with an excellent glossary of the technical terms of the foundry.

Patents as a Factor in Manufacturing. By Edwin J. Prindle. New York: *The Engineering Magazine.* 134 pages; 5 in. x 7 in.; cloth. Price, $2.

The opening statement of the preface of this book is a negative one. It says that "the purpose of this volume is not in any sense to make the inventor or the manufacturer his own patent lawyer." Instead of this it is intended to show him exactly what his status is before the law in regard to inventions that may originate with him or with his employees. There is a short resume, possibly somewhat gilded, as to the general value of patents, and instances are cited of those that have been pre-eminently successful as money getters. This is unimportant, but in the second chapter the author gets down to the work before him, setting forth the real nature of a patent and how it must be prepared in order to secure the desired results or at least the results that are warranted under the law. He then goes on to show the general scope and nature of the claims and what is dependent on them, and what the courts will read into and out of them. This naturally leads to the discussion of infringements and what protection the courts afford to the patentee, as well as what he must prove in order to obtain damages. From this it is a direct step to the consideration of the relations of employer to employee and what must be done on the part of the employer to secure even a shop right under a patent in the absence of a definite contract to assign. The extension of the word employee is also shown, including not only individuals but also corporations and companies who do work for an inventor. At the same time the book shows the danger of having patents issued to anyone who is not the actual inventor, as is frequently done in the case of large companies where there is a desire to concentrate all of the inventive ability that appears to the public in the president or other officer.

The final chapter takes up the matter of rival claimants and sets forth what must be done in order to establish the claim to invention.

It will be seen that the disclaimer of the preface is well taken and that the book will serve to show the manufacturer and inventor just what the respective standings are before the law and what they can expect from the patent office and the courts. There is not one word regarding patent office practice or as to the formalities that are to be observed in the securing of a patent. But just that sort of information is given that everyone interested in patents ought to possess.

Surveyor's Handbook. By T. U. Taylor. Chicago: Myron C. Clark Publishing Co. 310 pages; 4½ in. x 6½ in.; flexible cover.

This book is intended ostensibly for the use of surveyors in the field, and, as such, it is doubtful if it will meet all of the requirements. It presupposes considerable ignorance on the part of the surveyor as to the methods that are to be used in his work. For example, it is hardly credible that any man would start out on a piece of work who would need instruction as to Gunter's chain or tapes or range poles or plumbs. Yet a description of all of these are given in the opening pages. Again, he will hardly need instruction in the ordinary rudiment of geometry or as to the method of carrying his tripod and compass. If he does need all of this he should return to school and learn his profession over again.

Yet, while the book will be of little value to the trained man, it may meet his untrained assistants who are ambitious to learn. The scope of the book includes chain, compass and transit work, leveling, plotting, government surveying, and concludes with the trigonometric formulas for the solution of triangles and the usual tables of logarithms and of sines and tangents.

Shop Tests on Electric Car Equipment. Eugene C. Parham and John C. Shedd. New York: McGraw Publishing Co. 121 pages; 5 in. x 7½ in.; 55 illustrations; cloth. Price, $1.

This book is announced as the first of two that will deal in a practical manner with the testing of electric car equipment, using such instruments and facilities as are usually to be found in the ordinary car barns. Explanations of the methods to be pursued are given very briefly and without any attempt to explain the reason why, so that the manipulator of the tests will have to depend blindly on the results obtained, or be posted beforehand regarding the phenomena that he is investigating, for there is little or nothing in the way of electrical instruction in the book.

The opening chapters deal with the general subject of current measurements with the ammeter and details of the various methods to be pursued in measuring currents. This includes the use of the wattmeter for the same purpose. Voltage measurement with resistances of circuits and insulation is then taken up, using the methods of the voltmeter, the lamp circuit, the bell circuit and the magneto. The last third of the book is occupied with miscellaneous tests, and closes with a long series of questions intended to give the reader or student an opportunity to rehearse and fix the information that has been acquired from the preceding pages. At the end there is a good index, by which a ready reference to any particular test can be obtained.

Letters to the Editor.

ENGLISH RAILWAYS.

Yeadon, Pa., May 25, 1909.

To the Editor of the Railroad Age Gazette:

In reading Mr. Turlay's article on English railways, in your issue of May 21, I was glad to notice your footnote in regard to the arms of seats in first-class carriages, and would say that my own experience, although of a number of years ago, fully confirms it. During two different visits to Europe I did all my traveling in first-class carriages, and cannot now recall a single instance in which I found the seat arms fastened rigidly. I recall riding from Mallow Junction to Dublin on the night express and raising these arms to enable me to use the seat as a bed, and in the book published by the London & North-Western Railway, in 1876, to which I referred in my article of several months ago on "Short Fireboxes in Locomotives," a woodcut shows a compartment of a standard first-class

passenger carriage of the company arranged for sleeping purposes at night, and in this cut the arms are raised, and cushions are also drawn from one seat across to the other at one door; the whole arrangement enabling three persons to lie at full length.

At the time of my visits, the L. & N-W. was probably the only line using its own sleepers, or "Saloon" carriages, as they were styled. The Midland; Great Northern; North British, and London, Brighton & South Coast railways all used Pullman cars of the standard American types, the last named line, I believe, running only parlor cars. Even the "Saloon" carriage of the L. & N.-W., as shown in the volume referred to, was much like the Pullman in its interior arrangements. I certainly agree with Mr. Turlay in commending the greater privacy of the present English sleeping carriages, and trust it may not be long until our Pullman cars which are in almost every other way built on lines of good taste and refinement, will also be so constructed as to afford every occupant of each car that degree of privacy which is so great an essential of every well-ordered life and is especially desirable for women, young girls or children who may be traveling unaccompanied.

C. H. CARUTHERS.

HANDLING L. C. L. FREIGHT.

Harrisburg Freight Station, Pa., May 21, 1909.

TO THE EDITOR OF THE RAILROAD AGE GAZETTE:

The telfer system of loading and unloading vessels has been generally and freely canvassed among freight men for a number of years until it has become quite familiar as the most nearly adaptable to the purposes of the railway freight business of any of the overhead electric crane systems of handling merchandise.

Some time ago there was organized in New York the Anglo-American Moving Van Company, placing into international service the van or large container for the accommodation of an entire and complete shipment of household goods or other merchandise, and these vans are now coming into quite general use, serving the purpose admirably and containing the entire furnishings of a set of apartments for international (or other) shipment.

The third consideration that presented itself was the fact that the German government has caused or induced to be built along its improved and deepened waterways landing stages at each town of even but small importance, fully equipped with railway tracks and easy approaches by team, and equipped with overhead cranes of American manufacture; and has induced the building of lines of boats on these streams for the carrying trade, the entire decks of which are composed of removable hatches, so that, when unloading, the entire top of the vessel is removed and the crane has easy access to the entire contents of the boat for the purpose of unloading such freight as may be destined to the point of handling, or all the freight loaded and contained in the boat.

It seems to me that a combination of these principles would be a great benefit to railways in handling L. C. L. freight; and that it would pay each road to create a special department to have the oversight of the L. C. L. traffic moving over its lines. The appointment of a superintendent of transfers with the adoption of the overhead electric crane in combination with the van system of loading from receiving point to destination in one container, the container or van to be loaded on a flat car along with others to transfer point and there transferred by telfer or overhead traveling crane, and combined for classified territory upon other flat cars, would tend to place the express freight and all L. C. L. business upon a strictly modern basis, overcome much cause for complaint and delay, save money in the handling and re-handling, do away with much detail and worry and place responsibility for shortage and overage with the L. C. L. forwarding agent direct.

As it stands to-day the business is being handled and plans for new work are all being based upon the same idea as it was handled 50 or more years ago, upon a system of loading and transferring which involves the re-handling of each and every package loaded more or less indiscriminately into cars which were built and are primarily intended for bulk freight in carloads.

The use of the men at transfer points and large forwarding platforms could be so much better and more adequately devised that it seems strange that no combination has ever yet been effected for the express purpose of making the L. C. L. service of the specialized importance that has been assumed, for instance, by the refrigerator service, the coke service or the coal service, to say nothing of the express service. This, it strikes me, the system herein outlined will accomplish.

SANCHO.

DRAWING THE LINE BETWEEN THE MANAGER AND THE COMMISSION.

New York, June 2, 1909.

TO THE EDITOR OF THE RAILROAD AGE GAZETTE:

There has been so much criticism of commissions charged with the regulation of railways that the Railway Business Association has taken especial pleasure in noticing a recent opinion and decree of the New York Public Service Commission for the Second district which seems to reveal an attitude characterized by breadth of mind, painstaking care in ascertaining the practical factors and wisdom in applying fair principles.

The petition was a complaint of the residents of the village of Marathon against the Delaware, Lackawanna & Western, relative to passenger train service. The petitioners requested that the company be required to stop a certain one of its fast trains at Marathon. Commissioner Olmsted says in this opinion:

"The railway is entitled in the first instance to schedule its trains as seems to it most advantageous both as to time and stops to be made. The commission should not interfere with this arrangement unless the change asked for will serve the convenience of a considerable number of people and will not inconvenience a greater number; also that it will not seriously interfere with the running of trains and with the general operating plans of the railway considered as an entire system. * * * The principal petitioner has chosen to locate its business in a small village of 1,100 inhabitants. It undoubtedly had its reason for doing so: in small taxes, lessened cost of living of employees and the cheapness of manufacturing, etc. Having chosen to locate at that place it must take the disadvantages as well as the advantages of such a location.

"While it is true that the railway company might be able to make the stop at Marathon and yet keep its schedule time from Syracuse to Binghamton it is still a matter to be considered that in railroading a train which is scheduled to stop at a number of points is not as popular as one that runs through without stops."

Recognizing the reasonableness of maintaining express trains in competition with other railways, in this case the New York Central on through traffic to New York City, and quoting a Lackawanna official as saying that the policy of the road was to reduce the stops instead of increasing them on certain trains, the commissioner concludes: "We think that the railway has a right to pursue this policy, but not to the extent of seriously inconveniencing a large number of people, and that has not been shown to be the case in this instance."

So clear a demarcation of the line between matters which are properly the subject of regulation and matters which it is in the public interest to leave to the discretion of the operating managers should be gratifying to all concerned and tend to inspire confidence in the body enunciating it.

GEO. A. POST,
President, Railway Business Association.

Contributed Papers.

MANUAL BLOCK-SIGNALING IN ENGLAND.*

Signal Apparatus.—There are few automatic block singals in Europe. While there are small installations on double or four track lines, practically all of the English roads use the manual block system. This simple system of block signaling has been developed to the highest extent in England, and a comparison of the train accidents occuring under the manual block system in England and in the United States can not but compel the belief that the system has reached a higher degree of perfection in England than in this country.

All of the principal English lines are double track, and on those which carry heavy traffic the blocks are so short that in a good share of the territory the distant signal for one cabin is mounted on the same post as the home signal of the cabin in the rear. The distant signals are practically all mechanically operated semaphores connected to the lever by a single connection, the wire usually consisting of a light galvanized stranded cable. For the home signals both pipe and wire connections are used.

The cabins as a rule are of brick, solidly constructed, and maintained with scrupulous neatness. The night indications of both home and distant signals are alike—that is, the proceed indication is a green light and the night caution indication of the distant and the night stop indication of the home consist each of a single red light. On some four-track lines a ring or other distinguishing mark is added to the blades of signals on the outer tracks to distinguish them from the signals which apply to the inner tracks.

Communication Apparatus.—Communication from cabin to cabin is had by means of an electric-bell system used in connection with the needle telegraph and to some extent with telephones. The use of the needle telegraph, or its equivalent in the shape of a visual indicator operated in connection with the bell circuits, undoubtedly contributes greatly to the successful operation of the system as compared with a system operated entirely by the Morse telegraph, the reason being that with a visible indication, such as that given by the indicator or the needle telegraph, a record is constantly before the eye of the signalman showing the last operation of the communication system. With the use of the Morse telegraph the audible signal of the sounder must, of course, be written down by the signalman on his train sheet or block report to obtain a record of the operation of any portion of the system. Substantially the same forms of block records are kept on the English railways as in this country.

Rules.—The rules governing the manual block working are, in general, much like those of American railways, perhaps the most notable exception in detail working being the blocking back at stations or junctions. At a junction no train on one line is permitted to pass the block station in the rear of the one located at the junction while a conflicting movement is being made on the other line. In the same manner at certain stations one unoccupied block must intervene between the station block and any approaching train whenever a train is standing in the station. These are often suspended, however.

Signalmen.—As a rule, the English block signalman is probably no more intelligent than the American block signalman, but he is probably much better trained and under a stricter personal supervision. Passenger stations are so frequent on English roads that most block stations are under the jurisdiction of some stationmaster, and by far the greater percentage of signalmen are recruited from the ranks of the station porters. A smaller number are promoted from the track forces which furnish most of the fog signalmen, these men forming an important part of the personnel in English railway operation during the winter months. (A more detailed description of the fog-signaling methods is given in Part III, section F.) Suffice it to say here that the more intelligent trackmen (or plate layers, as they are called) are employed in times of fog and snow at the block stations, and thus have an opportunity to acquire a knowledge of the block system. When a man has served as a plate layer or station porter for a sufficient length of time to become familiar with the general working of the road in his vicinity, and a vacancy occurs in the grade of a signalman, he may be selected as a candidate for the post. If so, he is trained under a signalman at the designated cabin for a month, and at the end of that period is orally examined on his knowledge of the rules by the inspector, who, if the examination is satisfactory, fills out a competency certificate. The applicant is generally examined further by the assistant district superintendent who, if the examination is satisfactory, approves the certificate, and the man then appears before the district superintendent, who looks him over and may question him further, and if he is satisfied he signs the applicant's certificate. Should the applicant fail to pass the examination at the appointed time, he may be given another chance or be sent back to his former position at the discretion of the district superintendent. The method of selection and examination here described is that in use on the London & North Western. It is in substance the same on other lines.

If a man is transferred from one cabin to another, his period of training varies from about a week at the new cabin, if it is of practically the same class as his former post, to a fortnight if the new cabin is a more complicated one. Each man is examined not only as to his knowledge of his apparatus and the block-signal rules but in the local working conditions, and it should be noted that the British signalman not only has to perform the functions of signalmen but in addition practically acts as train despatcher for the blocks controlled from his cabin, for the very good reason that there is no such official as the train despatcher nor anyone corresponding to him on British railways.

The traffic conditions on most roads in England vary very little from year to year, as compared with conditions on American roads where new industries are constantly springing up and new lines of traffic of varying volume are being constantly developed. Most of the English lines run through territory already developed and the traffic demands of which are so well known that it is relatively easy to predict within reasonably close limits, from past experience, the nature and volume of the traffic on any division at any given time. On this account a much greater proportion of British freight trains, and in fact all trains can be, or at least are, run on schedule than is the case in this country. In fact very few trains except work trains are run without a schedule, the extra or special train movements for any month, or even for a single week, being scheduled in monthly or weekly supplements to the working time-tables.

The block signalman is required to be familiar with all these special train movements, and as all schedules are, especially in bad weather, subject to derangement, he must be familiar with a very large number of special rules governing the precedence of delayed trains, there being no despatcher to give him orders on such matters. In fact on some roads there is provided a book of "train margins," in which is set forth in detail the precedence of the various trains when they or other trains are late at junctions or other important points. As an example of this method of handling train movement under the block-signal rules, it may be noted that the special trains carrying passengers from the ports of arrival of American steamers to London are scheduled to use a given time between given points. The leaving time of such special trains from the steamship docks is, of course, variable and the actual leaving time is telegraphed to the principal stations on the line when the train leaves the port. On the basis of this actual leaving time and the published speed schedule the signalmen at junction points throughout the line must make their own arrange-

*From the fourth annual report of the Block Signal and Train Control Board, Interstate Commerce Commission, January 27, 1909.

ments for handling the branch and main line trains with as little delay as possible to either.

Probably the training in the conduct of such movements as those described above assists very materially in connection with the careful and voluminous instructions given to these men and the constant personal supervision to which they are subjected in making them the thoroughly competent and reliable signalmen that they are.

The system of inspection to which they are subject begins with that of the station master, who on some roads is required to make a daily inspection of the cabins under his jurisdiction and certify thereto upon the block report. District inspectors are also employed, who are supposed to visit each cabin about once a week, inspect the records and the work of the men, noting their visit on the block reports. Assistant district superintendents make frequent inspection, and on one road, at least, an inspector from headquarters visits each cabin once a year, and in addition to conducting an inspection examines the signalmen orally on the rules and special instructions. On most roads a premium or bonus is paid to signalmen for correct working of the block system, amounting to from £2 to £6 per year. Practically all roads have pension systems for their employees, largely supported, however, by the employees themselves.

As an example of the number of men engaged in signal operation, it may be noted that the Great Western employs 3,200 signalmen on 2,600 miles of territory.

The closing of a block station for a part of the day or night is common, the wires being switched through. In closing a block station the signals are cleared and usually the lights are extinguished, though if the office is to be again opened before daylight they are left burning. An office, say, Station B, may be cut out, the wires being connected through from A to C, if in time of sudden fog B has difficulty in securing fogmen for his signals.

The general impression obtained from an observation of the working of the English manual block system is one of admiration for the men, methods, system of training, and conditions that make possible the high degree of safety and celerity with which a great volume of fast and dense traffic is handled by its use.

CONTROLLED MANUAL.

While the English roads evidently have, as a whole, the best of signalmen, a number of companies have nevertheless introduced electric-control apparatus by which the men at the opposite ends of a block must co-operate in giving a clear signal. Whether from a knowledge of errors which have occurred but which have caused no collisions and have not been made public, or from the desire to provide all possible safeguards, regardless of the smallness of the percentage of errors occurring when these refinements of safety are not employed, or from an inclination to satisfy a real or fancied demand on the part of the public, these roads have taken action which indicates that their past records, good as they have been, are not entirely satisfactory. Among the roads which have done this are the London & South Western, the Great Northern and the Northeastern.

The Southeastern & Chatham Railway and the London, Brighton & South Coast Railway have had a controlled manual block system in use for a long time. Almost all single-track lines in Great Britain are worked by the staff system, this being a fully developed electric system giving a high degree of protection through electric control exercised over the manual operation of the block signals. The Caledonian Railway on its Callander and Oban line has for several years used a high-speed electric staff and tablet system, which is still satisfactorily operated, though most of the trains stop at all stations, the tablets being exchanged by hand. On some of the lines, however, where faster trains are run, the device for catching and delivering the tablets at speed is in successful use.

RULES TO BE UNDERSTOOD BY ALL ALIKE.

At the convention of the Train Despatchers' Association at Columbus, F. C. Dow (C., B. & Q., Sheridan, Wyoming) read a short but useful essay on the necessity of securing uniform understanding of train rules. He said, in part:

Often new instructions are issued to prevent the recurrence of an accident where insistence upon conformity to the original rule, disregard of which caused disaster, and a clearer understanding of its purpose and better interpretation of its language, would be all sufficient to produce intelligent obedience. Nothing can be more of a relief to a superintendent than knowledge that his employees will all act alike and with perfect understanding of what ought to be done in any contingency that may arise.

One road will have a set of rules that are the latest standard; another, an unrevised standard, and still others that never were standard; and yet they are all operated safely because all of the employees on each road understand and work as one, as far as the operation of the rules is concerned. Perhaps we might go so far as to say that a staff of men uniformly and thoroughly educated in certain methods, could maintain safety without any printed rules; even superintendents of divisions of one system may differ as to the meaning of a rule, or the application of it. This is dangerous. There are cases where the superintendent would not go on record, and evaded giving a decision, in certain cases, but would get around it by issuing special instructions through other channels, that quieted the matter for the time being, but left the thing still open and ready for another argument when the same conditions again arose..

We should unite in an endeavor to make our part above criticism in the respect that the dispatchers in an office all work alike, and not have one construing a rule one way and another another way. Differences of opinion as to construction of rules should be promptly submitted to the proper officer, if no ruling already exists, and a ruling obtained, which, when obtained, should be strictly conformed to.

THE LOGARITHMIC SCALE IN GRAPHIC CHARTS.

BY W. J. CUNNINGHAM,
Statistician, Boston & Albany Railroad.

The increasing use of the graphic chart in railway statistics is a gratifying indication of the passing of an attitude of indifference, if not to say aversion, to that method of presenting figures comparatively. While many still refuse to concede any special merit in charts, asserting rather that the time and expense are not justified except in technical work, their number is growing less. The so-called "practical" officer (as distinguished from his technical associate) is learning to appreciate the superiority of diagrams over tabular work, when different factors are to be compared with each other, with preceding periods, or both.

No other form of indicating the trend of receipts, expenses or work done (as expressed in train, engine, car or ton miles, cars handled, tons handled, etc.) equals the graphic method. By its use the high spots in expenses stand out like danger signals, and gradual but continued losses in efficiency are much more apparent at a glance than a careful study of the figures, by themselves, will disclose. It is trite to say that statistics in their usual form are dry, even repellant, to the busy officer. He prefers to deal with affairs of the hour or the morrow rather than study post mortem tabulations. But when the same information is put before him graphically it becomes attractive, and is replete with suggestions, both corrective and productive. Professor W. M. Cole, in his recent book on "Accounts, Their Construction and Interpretation," likens the accountant or statistician to the historian. The historian of deeds is relatively of lower rank than the doer,

but, Professor Cole adds, "as the historian often sees more deeply into politics than the busy politician or statesman, so the accountant often sees more deeply into business transactions than the manager himself. A statesman who disregards history makes himself ridiculous; a business man who cares nothing for accounts often makes himself not only ridiculous but a pauper."

It is plain, therefore, that the statistician, specializing as he does on the analysis and interpretation of statistics and accounts, does not perform his proper function unless he places the results of his analysis and research before the manager in a form which may readily be comprehended by him with the minimum outlay of time or study. To that end the graphic method is invaluable. Figures alone do not convey such instantaneous and lasting impressions; the graphic method makes it possible to take in at a glance a long series of related facts, and the general character of the changes therein, both as between themselves and between different periods of time.

Under certain conditions, however, the ordinary form of graphic chart is slightly misleading. It will be conceded that its true function is to portray comparative fluctuations. This result is practically secured when the factors or quantities compared are nearly of the same value or volume, but analysis will show that this is not accomplished when the amounts compared differ greatly in value or volume. The fluctuations shown are absolute rather than relative. The extent or degree of the fluctuation, as indicated by the ordinary chart, depends

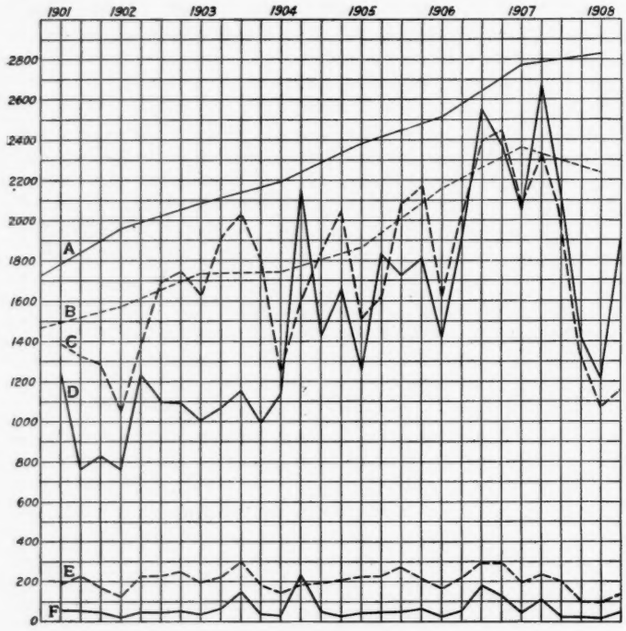


Chart 1—Natural Scale.

Passengers and employees killed and injured in train accidents. (From quarterly reports of the Interstate Commerce Commission.)
A = Passenger miles (2,000 on scale = 20 billion passenger miles).
B = Ton-miles (2,000 on scale = 20 billion ton-miles.)
C = Employees injured.
D = Passengers injured.
E = Employees killed.
F = Passengers killed.

in a measure on the proximity of the curve to the top or bottom of the chart.

As an illustration: if the scale has a range of 1 to 100, a curve beginning at 90 and affected by an increase of 10 per cent. would move upward nine units on the scale to 99, while a curve beginning at 10 and affected by the same percentage of increase (10 per cent.) would move upward but one unit on the scale to 11. The extent of the change in the curve near the top of the scale is nine times greater than in the curve near the bottom of the scale, yet in each case the relative change was the same—10 per cent. The chart registers the actual change in value, rather than the ratio or percentage of change. The wider the range of the scale the greater the variation between actual and relative changes.

The same criticism applies to charts which employ two or more scales for various curves. If the different scales are in proper proportion, the result is the same as with one scale, but when two or more scales are used which are not proportional an indication may be given with respect to comparative fluctuations which is absolutely false.

The percentage scale is used to some extent in graphic charts and corrects the deficiency in the ordinary chart by showing the changes in percentages of increase or decrease. But in correcting one deficiency, another is introduced. The per-

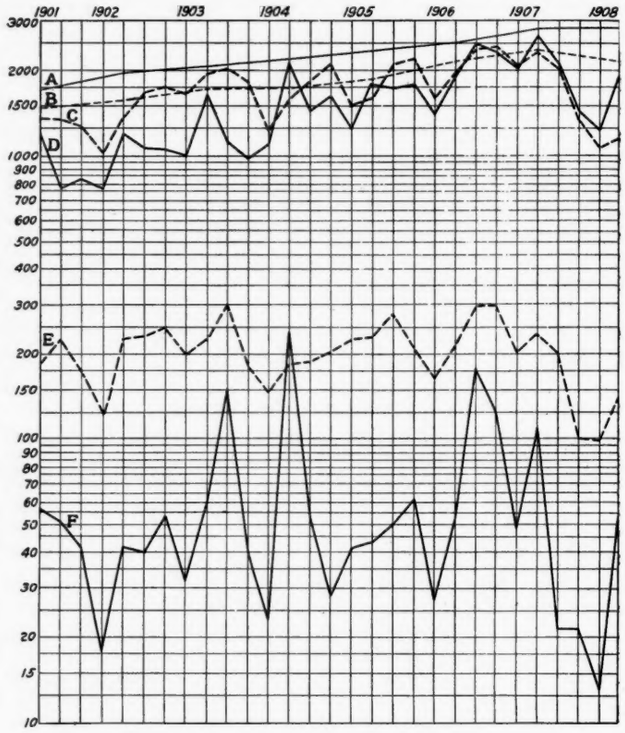


Chart 2—Logarithmic Scale.

Passengers and employees killed and injured in train accidents, all railroads in United States. (From quarterly reports of the Interstate Commerce Commission.)
A = Passengers carried 1 mile (2,000 on scale = 20 billion passenger-miles).
B = Ton-miles (2,000 on scale = 20 billion ton-miles.)
C = Employees injured.
D = Passengers injured.
E = Employees killed.
F = Passengers killed.

centage scale gives no clue to the magnitude of the quantity represented by any curve. The true proportion of relative changes is shown, but the actual value is not indicated. The use of the percentage scale also involves considerable labor in computing percentages of change.

As a substitute for the ordinary (or natural) scale and the scale of percentages, as well as compound scales, the logarithmic scale, or scale of ratios, practically meets the requirements. It permits the exhibition of both actual and relative values, and actual and relative fluctuations. While some knowledge of logarithms will make plain certain features which otherwise are hard to understand, no special knowledge of higher mathematics is essential to the use of the scale. The principles involved are the same as those embodied in the slide rule, and any treatise on the slide rule will make them sufficiently clear. An accountant who can plot a chart to the ordinary scale should have no difficulty in using the logarithmic. The scale may be copied from either side of the slide rule or worked out easily to fit any space by dividing it into tenths and hundredths and using the logarithmic tables to plot the lines corresponding with the notation in the scale column.

To illustrate the features to which reference has been made, two charts are presented, each showing graphically the same figures. The data are taken from the quarterly accident bulletins of the Interstate Commerce Commission and the annual reports of the same body. The subject of train accidents is of sufficient importance in itself to make either chart of interest, showing as each does the close relation between accidents and volume of traffic. The "passenger miles" and "ton miles" for fiscal year ending June 30, 1908, are estimated from the preliminary report of the commission showing passenger and freight revenue.

Chart 1 uses the ordinary or natural scale; chart 2 has the logarithmic scale. The advantages of the latter are apparent by comparison. On the natural scale fatal injuries reflect little change, while non-fatal injuries fluctuate within wide bounds. Fatal injuries, being so much smaller in number, appear very near the bottom of the chart, and it takes a very marked increase or decrease to register an appreciable change in the curve. On the other hand, non-fatal injuries, being very much greater in number, are near the top of the scale, and a very slight percentage of increase makes the line shoot upward.

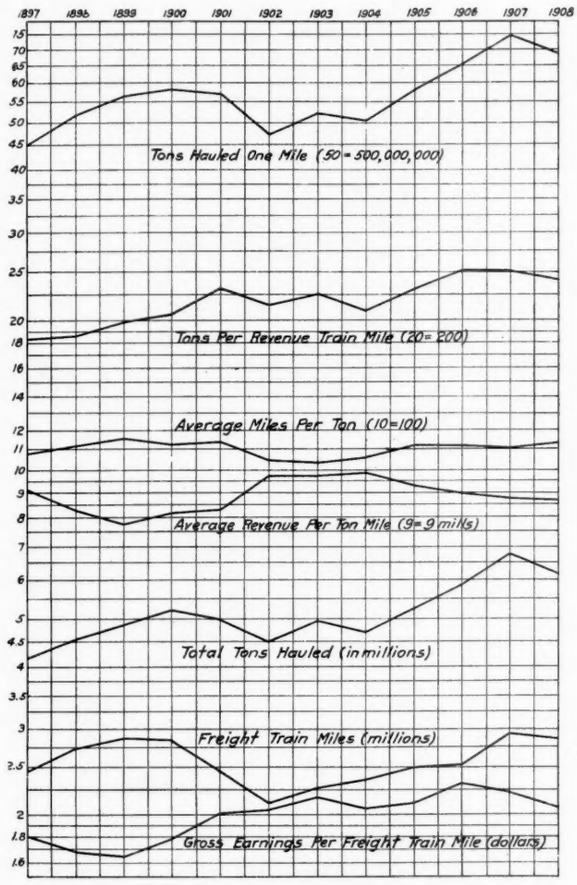


Chart 3—Logarithmic Scale.

Freight statistics of the Boston & Albany; year ending June 30.

Chart 2 shows the two lower lines with their true ratio of change and indicate that relatively they fluctuated more than the upper lines. Compare, for instance, the third quarter of 1904. Fatal injuries to passengers increased from 23 to 228 (nearly 900 per cent.), while non-fatal injuries increased from 1,134 to 2,154 (90 per cent.). The percentage of increase in fatalities in that quarter was ten times greater than the percentage of increase in non-fatal injuries, yet the chart with the natural scale does not give that indication. Chart 2, with the logarithmic scale, shows the relative changes in true proportion.

As another instance, note the decrease in the last quarter of 1907. Passengers injured dropped from 2,663 to 2,125 (about 25 per cent.); passengers killed, from 261 to 21 (92 per cent.). The percentage of decrease in fatal injuries was nearly four times greater than in non-fatal injuries, yet an opposite indication is given by chart 1. The true ratio of change is shown on chart 2.

As a further example of the practical utility of the logarithmic scale, where a single chart with the ordinary scale could not have been used, chart 3 is presented, showing various freight statistics. With the natural scale the fluctuations in "tons hauled one mile," "average rate per ton mile" and "total tons hauled" would be out of proportion with the other curves lower on the scale. In fact, the curves on the lower half of the scale would be so close together as to make them indistinguishable.

No matter on what location on the chart, when the logarithmic scale is used the angle of upward or downward inclination is the same in all curves affected by the same percentage of change. A curve having an upward inclination equalling the distance from 100 to 200, 200 to 400, 300 to 600, or the distance between any number on the scale and double that number, has had an increase of 100 per cent. In other words, the quantity has been doubled. It will be noted that the distances on the scale from 200 to 400, 300 to 600, etc., are equal, the ratio in each case being 1:2, or 100 per cent. A curve having an upward inclination from 100 to 300, 200 to 600, 300 to 900, or the distance between any number on the scale and three times that number, has had an increase of 200 per cent. The ratio in the latter cases is 1:3, or 200 per cent.

The scale for decreases works somewhat differently. A curve having a downward inclination from 100 to 80, or any distance equal to it from any starting point, has had a decrease of 20 per cent. A downward inclination equal to the distance from 100 to 60 equals 40 per cent.; from 100 to 40, the percentage of decrease is 60 per cent.; 100 to 20, 80 per cent.; 100 to 10, 90 per cent. A decrease of 99 per cent. would be reflected by a curve with a downward inclination equalling the distance from 100 to 1; 99.9 per cent. by the distance from 100 to 0.1; 99.99 per cent. by the distance from 100 to 0.01, and so on, ad infinitum.

To summarize: With the ordinary scale, fluctuations in large factors are very noticeable, while relatively greater fluctuations in smaller factors are barely apparent. The logarithmic scale permits the graphic representation of changes in every quantity on the same basis, without respect to the magnitude of the quantity itself. At the same time, it shows the actual value by reference to the numbers in the scale column. By indicating both absolute and relative values and changes to one scale, it combines the advantages of both the natural and percentage scale, without the disadvantages of either.

TRAIN DESPATCHERS' ASSOCIATION.

The twenty-second convention of the Train Despatchers' Association of America was held at the Southern Hotel, Columbus, Ohio, June 15, F. D. Poland, Chief Despatcher of the Hocking Valley, General Chairman of the local committee of arrangements, presiding. M. S. Connor, General Superintendent of the Hocking Valley and the Toledo & Ohio Central, spoke briefly, recalling his connection with the association in the early days of its history, and on behalf of the railways centering in Columbus bade the members of the association welcome; and welcoming addresses were made by others. The forenoon was devoted to social intercourse. In the afternoon President Carl A. Mitchell read his annual address, and the report of the executive committee was submitted. The assets of the association have increased during the year $171. Attention was called to the cost of the official organ, and members were urged to greater activity in its support.

Letters of resignation from sixteen members were read and six were reported as having died during the year, leaving the membership of the association 964, which was a decrease from the previous year of 122. This falling off the Secretary-Treasurer attributed to the general depression in railway business which had borne with peculiar severity on train despatchers, and the members were urged to do all in their power both to increase the membership of the association and the circulation of its official organ.

The report of the train rules committee recommended changes in Rule 4 of the Standard Code, so as to make that rule read:

"Each new time-table from the moment it takes effect supersedes the old time-table, and its schedules take effect on any division (or sub-division) at the leaving time at their initial stations, on such division (or sub-division); except that when the schedule of the new time-table corresponds in number, class, day of leaving, direction and initial and terminal stations, with the schedule which was than in effect by the old time-table, it will take effect at once, subject to the provision of Rule 82; and a train due on the road, by the old time-table, will assume the schedule of the same number of the new time-table, and retain its train orders.

"Schedules on each division (or sub-division) date from their initial station on such division (or sub-division).

"But one schedule of the same number and day can be used on the same part of a division (or sub-division)."

The committee believe that this rule, since it explicity directs to be done what under the Standard Code rule has to be inferred, will be better understood by trainmen in general, than the Standard Code rule. The principle involved is precisely that of the Standard Code Rule 4.

The committee also recommended an addition to Form-A, reading:

"When a superior train is ordered to take the siding at a meeting point, such provision applies only to that meeting point under that order." Or as an alternative add to Example (1):

"This form may be modified by adding: 'No. —— take siding,'" followed by the explanation: "When a superior train is ordered to take the siding at a meeting point, such provision applies only to that meeting point under that order."

Modifications were recommended also in Form F, Form J and Form H.

The committee expressed itself more than ever impressed with the desirability of a "schedule fulfilled signal," to be displayed on the last section of a schedule consisting of sections, or on a solitary train fulfilling a schedule, and also with the desirability of an identification signal whereby the identity of every train might be made known to other trains passed or met. No special device was recommended, but what the committee had in mind was a combination classification and identification device to be carried on the front of every road engine, similar to the cupola indicator now generally used on freight train cabooses; and the present cupola indicator might be dispensed with. In view of the provisions of Rule 4 the committee believes that time-tables should show day of reading at head (or foot) of schedule column only at initial stations, and not at all at arrive stations.

The report was, after considerable discussion, approved by the convention, except the recommendation last mentioned. The discussion continued not only through the afternoon session of Tuesday, but occupied the entire business session of Wednesday.

A paper was read by F. C. Dow (C., B. & Q.), Sheridan, Wyo., on uniform understanding of train rules and order which evoked considerable discussion. A paper on The Train Despatchers' Status, by J. F. Mackie, secretary of the association, was also read and was warmly applauded. Twenty-seven members were elected during the various sessions of the convention.

On Tuesday evening a reception was held in the parlors of the Southern Hotel; on Wednesday evening there was a banquet, and on Thursday evening the members went to the Park Theatre. On Friday there was an excursion over the Pennsylvania lines in a special train to Sandusky, and thence by boat to Cedar Point.

The election of officers for the ensuing year resulted as follows: President, T. D. Dellmin (L. S. & M. S.), Youngstown, Ohio; Vice-President, F. C. Dow (C., B. & Q.), Sheridan, Wyo.; Editor J. F. Mackie (C., R. I. & P.), Chicago, Ill.

There was no election for Secretary-Treasurer, the incumbent of those offices holding over. The next annual meeting will be held at Spokane, Wash., June 21, 1910.

DISCIPLINE OF TRAINMEN.*

BY DANIEL WILLARD.

Nothing is more essential to the safe and efficient operation of a railway than good discipline. . . . To establish and maintain good discipline, it is necessary that the men affected should be properly instructed as to their duties and responsibilities. . . . Doubtless it is true that a large majority of the men in the train and engine service fully appreciate the necessity for good discipline, and prefer to work where discipline is known to be strict, providing also it is fair; and it is probably also true that a large majority of the men in such service are willing and anxious to obey the rules, and to do their work as required, and no doubt they feel much humiliated when accidents are caused by their personal fault. This feeling, which also stimulates pride in good work, is of itself sufficient, if properly developed, to keep the majority of the men in harmony with discipline requirements.

The practice of suspending a man from service for 15, 30, or even 60 days as in some instances, cannot possibly make him better, while on the contrary it deprives him of the opportunity to earn money with which perhaps to support his family, and not infrequently when a man has been so deprived of the opportunity to work, the punishment has borne most heavily upon those dependent upon him. It does not seem that a proper system of discipline should require such results.

When a man enters the employ of a railway company, that fact with certain other necessary information should be recorded in a book provided for that purpose. He should be fully instructed concerning his work, and it should be explained to him that his term of service will depend upon the manner in which he performs the duties assigned to him, and his advancement to better positions will be subject to the principle of seniority, *but only so far as his work justifies*, and in order that this question may at all times be clearly determined, it is essential that a complete record of his service be kept. . . .

It should be possible to keep such a fair, and at the same time accurate, record of the men in train and engine service that it can be made a sufficient basis for a system of discipline which will satisfy fully the requirements of existing conditions. Such a system, however, will call for greater care and personal attention on the part of all officers than has perhaps been given to this subject in the past, but it is believed that its importance justifies the additional effort.

To make the most of such a system it is necessary, or at least desirable, that the superintendent should know personally all, or as many as possible, of his train and engine men. He should make sure that they are all properly instructed concerning the duties which they are expected to perform, and he should be able, either personally or through his assistants, to keep a constant supervision over their work. . . . Where a failure was due to a lack of knowledge, and not to indifference, neglect or carelessness, it may not be necessary to place the matter upon the man's personal record, but it is

*On the Chicago, Burlington & Quincy discipline is now administered "by record" and without suspensions, as was announced in the *Railroad Age Gazette* of May 7. The paragraphs here given are from the preliminary circular sent out by Vice-President Willard.

necessary that the whole subject be fully explained to him. . . . Any act which approaches insubordination, but which of itself is not sufficiently serious to justify dismissal, should also be mentioned in the record. It is not necessary or desirable, however, that accidents or mistakes which may occur, but through no wilful neglect or carelessness on the part of the employee, should be placed upon the permanent record, unless of frequent occurrence; for certain matters of that kind will happen to all men, and the employees should be assisted so far as possible in keeping their records clear.

It frequently happens that employees in the train and engine departments have opportunity to do things outside of their specified line of duty, and by so doing prevent accidents which might result in loss of life or damage to property. When such acts are performed, they should be made a part of the employee's record.

A large number of experienced train and engine men are necessary for the efficient handling of the company's business; no credit attaches to the mere act of discharging a man from the service; great credit is due the officer who succeeds in building up a body of loyal and efficient men; it is an expensive matter to educate men to be conductors and engineers; and the cost of his education is lost when such a man is dismissed.

ACCIDENT BULLETIN NO. 30.

The Interstate Commerce Commission has issued accident bulletin No. 30, giving a summary, in the usual form, of the railroad accidents in the United States during the three months ending December 31, 1908. The number of persons killed in train accidents was 184 and of injured 2,924. Accidents of other kinds bring the total number of casualties up to 17,644 (798 killed and 16,846 injured). These reports deal only with (a) passengers and (b) employes on duty.*

TABLE NO. 1.—*Casualties to Persons.*

	Passengers		Employees		Tot'l persons reported	
	Kil'd.	Inj'd.	Kil'd.	Inj'd.	Kil'd.	Inj'd.
Collisions	19	932	97	875	116	1,807
Derailments	15	457	42	352	57	809
Miscellaneous train accidents	..	14	11	294	11	308
Total train accidents	34	1,403	150	1,521	184	2,924
Coupling or uncoupling	..	...	44	676	44	676
Other work abt trains or switches	..	...	19	3,948	19	3,948
In contact with bridges, etc	1	5	24	356	25	361
Falling from cars or engines or while getting on or off	44	770	148	2,881	192	3,651
Other causes	19	730	315	4,556	334	5,286
Total other than train ac'd'ts.	64	1,505	550	12,417	614	13,922
Total all classes	98	2,908	700	13,938	798	16,846

The number of passengers here recorded as killed in collisions and derailments, 34, is only two-thirds as large as in the last preceding quarter (when there were 8 notable collisions); and the present record, for the purposes of comparison, might fairly be reduced still further by deducting the 15 casualties charged to derailment No. 4, Table 2*a*, which, as will be seen, occurred under very unusual circumstances. Making this deduction the present record would be reduced from 34 passengers to 21 passengers, or exactly the same number as that shown in Bulletin No. 26, one year ago. In the present record the only accident which is notable, as regards fatalities to passengers, is collision No. 24; but there were two which together caused the deaths of 16 employees—collisions No. 10 and No. 26.†

Aside from item No. 1, as noted in the foregoing paragraph, the figures given in Table No. 1*a*, below, show generally considerable increases when compared with the last preceding quarter, but the decreases when compared with the corresponding quarter one year ago.

TABLE NO. 1A.—*Comparison of Principal Items with Last Bulletin and with One Year Back.*

	Bulletins		
	No. 30.	No. 29.	No. 26.
1. Passengers killed in train accidents	34	53	21
2. Passengers killed, all causes	98	110	81
3. Employees killed in train accidents	150	138	199
4. Employees killed in coupling	44	39	77
5. Employees killed, all causes	700	624	1,011
6. Total passengers and employees killed	798	734	1,092

The total number of collisions and derailments in the quarter now under review was 2,684, as below:

TABLE NO. 2.—*Collisions and Derailments.*

	No.	Loss.	Persons Killed.	Persons Injured.
Collisions, rear	303	$339,217	45	498
" butting	151	292,124	43	581
" train separating	122	47,336	1	68
" miscellaneous	797	351,172	27	660
Total	1,373	$1,029,849	116	1,807
Derailments due to:				
Defects of roadway, etc	242	$138,145	1	273
Defects of equipment	629	437,640	5	131
Negligence	81	49,757	11	64
Unforeseen obstruction	68	78,003	24	127
Malicious obstruction	14	20,548	3	47
Miscellaneous causes	277	186,191	13	167
Total	1,311	$910,284	57	809
Total collisions and derailments	2,684	$1,940,133	173	2,616

Following is the usual list of Class A train accidents—all in which the damage is reported at $10,000 or over, notable cases in which passengers are killed, and those doing damage less than $10,000 and down to $2,000, wherever the circumstances or the cause may be of particular interest:

TABLE 2A.—*Causes of Thirty-four Prominent Train Accidents (Class A).*

[NOTE.—R. stands for rear collision; B., butting collision; M., miscellaneous collisions; D., derailment; P., passenger train; F., freight and miscellaneous trains.]

Collisions.

No.	Class.	Kind of train.	Killed.	Injured.	Damage to engines, cars & roadway.	Reference to record.	Cause.
1	M.	P. & F.	0	0	$300	13	Collision at crossing at 2 a.m.; crossing not equipped with fixed signals. Passenger train, having stopped 200 ft. from crossing, was started forward and ran into side of freight train, engineman not seeing the freight cars.
2	M.	F. & F.	1	0	865	14	Collision occurred in yard; engineman of empty engine negligent. One passenger killed.
3	M.	F. & F.	1	0	1,700	40	Engine backing onto sidetrack bumped standing cars, which ran out on main track and collided with another train. Conductor and brakeman applied hand brakes, but were unable to prevent collision. One passenger killed.
4	R.	F. & P.	4	14	2,200	1	Passenger train standing at station run into at rear by following freight; passenger brakeman neglected flagging; freight was running at excessive speed. Four passengers killed.
5	R.	F. & F.	0	1	2,400	50	Two trains had been coupled together to get over a hill; were separated at the summit; leading train had among its cars a dead engine, and by this operator at next station was deceived. He thought that there were two trains, and thereupon authorized the station in the rear to send on another train.
6	R.	F. & F.	1	1	2,835	3	Standing train not protected by red signal; was run into by a train which was not properly controlled; one drover killed.
7	B.	F. & F.	0	3	3,152	10	Operator accepted order after train had left. (See note in text.)
8	B.	F. & F.	0	7	3,739	39	Operator, having two orders, one Form 19, one Form 31, delivered Form 19 only. Operator in service at this place one week; had had ten years' experience elsewhere.
9	B.	F. & P.	1	16	4,068	32	Freight train ran out of siding because not under control (See note in text.)

*The term "passengers" includes passengers traveling on freight trains, postal clerks, and express messengers, employees on Pullman cars, newsboys, live-stock tenders, and men in charge of freight.

†The monthly accident records published in the *Railroad Age Gazette* show that:

Collision No. 10 occurred at Mid Canon, Mont., Dec. 28.
" " 24 " " Little Woods, La., Nov. 11.
" " 26 " " Borie, Wyo. .....Nov. 10.

No.	Class.	Kind of train.	Killed.	Injured.	Damage to engines, cars & roadway.	Reference to record.	Cause.
10	B.	F. & F.	7	11	4,616	55	Conductor and engineman of freight held an order to run 1 hr. and 30 min. late; forgot order and ran 1 hr. and 15 min. late. Six carpenters and 1 brakeman killed.
11	B.	P. & P.	2	11	6,075	31	Misreading of despatcher's order. (See note in text.)
12	B.	P. & F.	0	25	7,314	7	Failure to observe wait order; conductor and engineman both apparently forgot that the order had been delivered to them.
13	B.	F. & F.	2	4	8,000	8	Failure to observe wait order and failure of inferior train to clear time of superior 5 min.
14	B.	F. & F.	2	5	8,300	38	Conductor accepted orders from operator and receipted for them, yet left them in office and moved his train regardless of their instructions.
15	B.	P. & F.	0	9	9,000	33	Conductor and engineman, having an order that the second section of a train would be 1 hr. late, carelessly assumed that both the first and second sections would be that much late.
16	M.	F. & F.	0	0	9,600	15	Train backing in on siding pushed boarding cars out on main line; these ran 2½ miles uncontrolled and collided with work train; wreck took fire and was burned up.
17	B.	F. & F.	1	4	10,000	53	Conductor and engineman misread or assumed name of station in telegraphic order; order was plainly written and the two names were utterly unlike.
18	R.	F. & F.	0	3	10,200	27	Failure to flag when backing out of siding.
19	B.	P. & F.	1	7	11,020	6	Conductor and engineman saw engine 605 standing on sidetrack and mistook it for engine 602, which they were to meet.
20	B.	F. & F.	4	3	12,148	37	Entire crew of northbound train forgot or ignored schedule of southbound.
21	B.	P. & F.	1	47	12,550	52	Freight encroached on time of passenger train. Engineman disregarded schedule of passenger train. It was Christmas day and his ignoring of the passenger train was due to his mistaken impression that the day was Sunday, on which that passenger train did not run.
22	B.	F. & F.	2	5	14,700	40*a*	Operator reported that an extra train had passed when in fact it had not arrived; despatcher acted on this misinformation.
23	B.	F. & F.	1	4	15,200	34	Engineman forgot order. (See note in text.)
24	R.	P. & P.	8	27	20,000	24	Engineman disregarded time interval. Eight passengers killed. (See note in text.)
25	R.	P. & F.	0	7	21,145	25	Freight train, delayed while entering sidetrack, encroached on time of following passenger train. Report indicates that this freight had left last preceding station when there was not sufficient time; so that the delay at the side track was not the only contributing cause of the collision.
26	R.	F. & F.	9	4	24,700	30	Runaway; mismanagement of air brakes on 79-ft. descending grade. Nine employees in work train killed.
Total.....			48	218	$225,827		
					Derailments.		
1	D.	F.	2	13	$250	20	Caboose occupied by track laborers overturned by wind.
2	D.	P.	1	6	2,300	66	Misplaced switch.
3	D.	F.	1	0	2,500	63	Broken flange. One passenger killed.
4	D.	P.	15	15	5,000	18	Track destroyed or weakened by fire. (See note in text.)
5	D.	P.	0	13	5,644	21	Rail maliciously removed.
6	D.	F.	2	0	6,000	22	Switch maliciously misplaced. Engineman and fireman killed.
7	D.	F.	0	0	6,990	68	Log on car projected and struck and demolished bridge; bridge and 9 cars fell to river.
8	D.	P.	0	25	11,984	19	Trestle bridge weakened by fire. Engineman saw smoke a half-mile away, but misjudged its location. Superintendent apparently does not blame engineman, but the track department is held blameworthy for not having burned weeds and grass to safeguard bridge against fire.
Total.....			21	72	$40,678		
Grand total.			69	290	$266,505		

Derailment No. 4, causing the death of 15 persons, occurred near Metz, Mich., on the Detroit & Mackinac Railway, October 15, in the midst of extensive forest fires, and its immediate cause was the distortion of the track by the heat from a pile of burning sleepers, which lay near the track. The train, consisting of an engine and 6 freight cars, had been made up hastily to carry to a place of safety the inhabitants of a small village (Metz), this being the only chance of saving their lives. The atmosphere was filled with smoke so dense that the engineman could not see far ahead, and there was great danger; but it was impossible to go in the other direction, and it would have been fatal to remain at Metz. The refugees, numbering about 75, were in a steel gondola car. When the engine was derailed, about 1½ miles from Metz, in consequence of the weakness or displacement of the track, the cars, of course, could not be moved farther, and thus were left close to the burning sleepers and at the mercy of the flames; and 12 persons in the gondola car, unable to escape, were burned to death. One man, riding on the engine, escaped from the engine, but was burned to death on the ground a few feet away. Two trainmen were killed, and the list of injured persons includes 13 refugees and 2 trainmen. One of these latter, Conductor John Kinville, was severely burned in trying to save some of the persons in the gondola car. In the accident record these victims, except those who were employees of the railroad, are classed as passengers; but in view of the peculiar circumstances of the case this note is added to explain that the deaths and injuries do not come within the ordinary classification. It does not seem proper, however, to class the refugees as trespassers, and, therefore, the compiler has not felt at liberty to exclude the figures from the record.

Collision No. 24, killing 8 and injuring 27 passengers, was due to disregard of the 10-minute time-interval rule. Both trains were passenger trains, southbound, one due to leave S at 7 a. m. and the other at 7:30 a. m. The latter train came on to the main line from a branch at this point. The leading train was 30 minutes late leaving S. The second train was recorded by its conductor as leaving S at 7:30, which was exactly the time that the leading train left; but from testimony given before a coroner it appears that the actual time of departure was 7:35, making an interval of 5 minutes between the two trains. The rule requires that this time interval shall be 10 minutes. The junction being a registering station, the station agent or operator was not required to hold the second train to keep it 10 minutes behind the first, but this duty rested on the conductor and engineman, who were required always to examine the train register before leaving junctions.

The collision occurred at L, which is 17½ miles South of S. According to the men on the leading train, it occurred at 8 a. m., indicating that this train had run about 7 minutes faster than its schedule. According to the men on the other train, it occurred at 8:04 a. m. The leading train had made two stops of 30 seconds each for passengers; had stopped to open and close a switch at a station, and had reduced speed to about 10 miles an hour at one other point. It had started from L and was moving about 10 miles an hour when the collision occurred.

The second train was warned twice by drawbridge tenders of its proximity to the leading train, but the report says that the engineman inquired of the draw tender why he was stopped, and, on being informed, replied with derisive remarks, and he passed the drawbridge without having received the proceed signal. The report says that this reckless conduct on the part of the engineman of the second train was repeated at the second drawbridge, and that the train was running at a high speed when it struck the leading train. Its engine crushed 3 cars of the leading train and damaged a fourth, and did not stop until it had run 635 feet beyond the point where it first struck. There was a dense fog at the time,

making it impossible to see more than about 500 feet. The engineman says that he saw the preceding train about 500 feet before he reached it, but it is believed by the officers that he did not see it until his engine struck it. The evidence of two witnesses, one at L and one some distance back, is quoted to show that the engineman was not keeping a good lookout. He was facing backward, and apparently talking with another engineman who was riding in the cab. The brakes of both trains were set automatically as soon as the collision occurred, rupturing the air pipes; but in spite of this the distance run was 635 feet, as before stated. The schedule time of the second train from S to L, about 29 minutes, was 8 minutes less than that of the leading train.

Collision No. 7, occurring about 2 a. m., was due to misinformation given to the despatcher by the operator at A. A freight train with 2 engines arrived at A at 1:20 a. m., and the operator, assuming that the helping engine was the regular engine of the rain, made a mistake in reporting the numbers—the train being an extra freight, and trains being identified by the number of the engine—and continued to assert to the despatcher that the regular engine of the train—that is, the train itself—had not arrived. Accepting this information, the despatcher gave the right to the road to a train coming from the opposite direction. The operator in this case was 18 years old and had been in the service only 1 month. The despatcher was 21 years old. He had been a despatcher for about 6 months and an operator 4 years.

Collision No. 9 was between a southbound passenger train and a northbound local freight train. It occurred at 6:35 p. m., November 13. The freight train had entered the side track at the station to make way for the passenger train, but in consequence of the engine not being properly controlled the train ran through the side track and out upon the main line at the north end, and the collision occurred about 400 feet north of the north switch. The freight was to stop at that station long enough for the trainmen to eat supper, and the engineman had got off the engine a little distance short of the station, to go to a hotel. According to the testimony of this engineman the engine (moving) was left in charge of the fireman, but the fireman denies having received instruction to that effect, and he was on the front of the engine, covering the headlight, and therefore did not shut off steam or apply the brakes. The headlight being covered, the engineman of the passenger train did not see that the main track was obstructed until he was almost at the point of collision. The conductor of the freight train was also held at fault for allowing the train to move so far after it had entered the side track.

Collision No. 11 was due to a mistake of an engineman in reading a telegraphic order. This engineman, running southbound train No. 3, went past the appointed meeting station at full speed, having unaccountably taken the order to mean the next station south, the two names beginning with the same letter. The conductor had neglected to require the engineman to read the order aloud in his presence. The conductor had read the order to the baggageman, but the baggageman appears to have taken no pains to keep the meeting place in mind, as the train passed that station without his knowing it.

The collision occurred 2½ miles beyond the appointed meeting place. The northbound train, No. 4, was running faster than its schedule, the despatcher having ordered it to reach the meeting point, if possible, 5 minutes ahead of its schedule time. For giving this order the despatcher is blamed. All of the men at fault have been in the service several years, with good records, except the baggageman, who had been in the service only 1 year.

Collision No. 23 was caused by the engineman of the southbound train disregarding a meeting order and running 1½ miles beyond the station where he should have met the northbound train. The engineman and conductor had both read the order, and the conductor, the flagman and the firemen testify that they understood the meeting point to be as it was written in the order; but the engineman, although he received the order and read it with the others, got the impression, in some way, that it named another station farther on. The fact that the train was running beyond the meeting point was first discovered by the flagman. The testimony of the conductor concerning his endeavors to stop the train is confused; but at any rate he did not succeed in reducing the speed materially before the collision occurred. Both trains were running at about 30 miles an hour when they struck each other.

FEDERAL ELECTRIC INTERLOCKING AT INDIANAPOLIS.

The Federal Signal Company has installed for the Cleveland, Cincinnati, Chicago & St. Louis at Indianapolis two all-electric interlocking plants. One called the West Side Belt plant, is at a crossing of the Big Four and the Indianapolis Belt. The other, the West End of Moorefield plant, is at a junction of the Big Four and the Peoria & Eastern, and also includes a crossing of the Big Four and the Indianapolis, Crawfordsville & Western, an electric interurban road.

At the West Side Belt plant power is supplied by a 6 h.p. vertical Fairbanks-Morse gasoline engine, direct connected to a Fairbanks-Morse 3.5-k.w. generator, situated in the basement of the tower. On the first floor is the storage battery and on the second the interlocking machine. The machine has 43 working levers in a 56 lever frame. It controls 35 signals, 23 switches and derails and 3 sets of crossing bars.

At the West End of Moorefield plant power is supplied by a motor generator set, taking current from the electric railway. The motor generator set and storage battery are on the first floor and the interlocking machine on the second floor of the tower. The machine has 21 working levers in a 24-lever frame. It controls 16 signals, 13 switches and derails and 2 sets of movable point frogs. The "Federal Switch Guard" is used on the electric road instead of detector bars, owing to the narrowness of the tread of the electric car wheels.

The Federal electric interlocking machine is a miniature mechanical Saxby & Farmer, to which have been added the necessary controllers and indicating devices to control electric switch and signal movements.

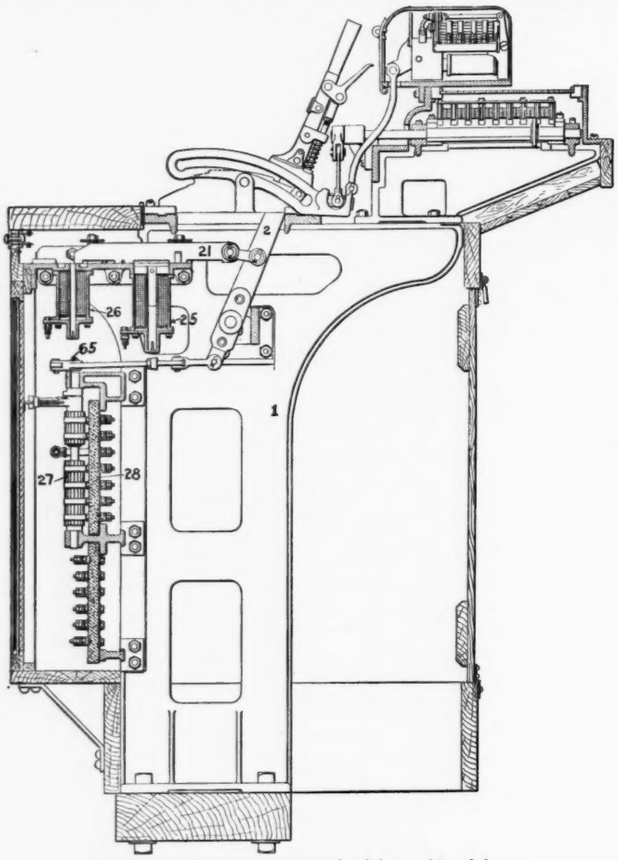
Attached to the front side of each lever is a slide, 21, fitting in a groove in the top plate of the machine. This slide has several pockets or notches on its lower side, the use of which will appear below. There is an indication coil consisting of a solenoid, 25, supported by the top plate, under the slide. A safety coil, 26, is mounted in front of the indication coil and has two windings. The controllers for the various functions consist of contacts mounted on a vertical roller 27 on a slate panel 28 situated in the lower front portion of the machine. The roller is turned by movement of the lever (2) by means of a crank (65). There are, in the case of a switch, four contact devices. One shifts current from one to the other of the control wires when the lever is moved, two others make a connection to common respectively as explained below, for one or the other of the control wires, viz.: the one which will be used in the next operation of the switch, and the fourth connects the indication coil to the indication wire which will be used in the next operation. In the case of a signal only half as many connections need to be made as there is no reverse indication or normal control circuit. A switch movement is controlled by four wires in addition to the main common, two of which are operating and two indication wires.

The switch movement consists of an ordinary mechanical switch and lock movement driven by an electric motor through a screw motion. A photographic view of it was shown in the *Railroad Age Gazette* of June 18, page 1308. It has suitable circuit controllers to cut out the motor at the end of the stroke and to close the indication circuit. At the same time that the motor is cut out at the end of the stroke, the control wire for the next operation is connected. The motor has two field windings, one for normal and one for reverse operation.

The signals, both high and dwarf, are moved by motors. The mechanism consists of a motor driving a train of gears. By means of a clutch these engage with the crank-arm operating the signal. The clutch armature carries a projection which catches one of several pins on a large gear.

The operation of the machine is as follows:

The lever is reversed as far as the indicating point, moving



Federal Electric Interlocking Machine.

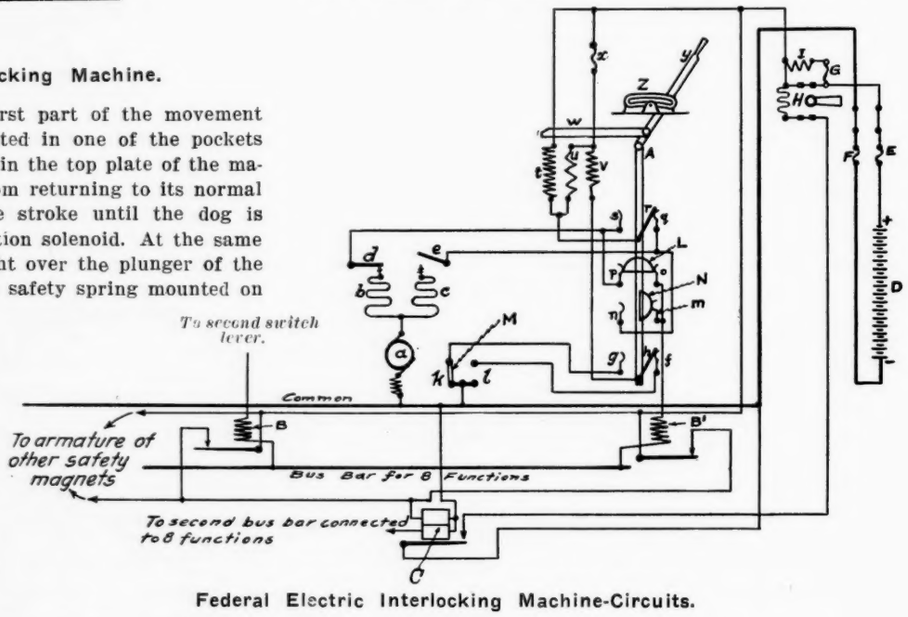
forward the lock slide. On the first part of the movement the indication dog, which is mounted in one of the pockets of the slide, is forced into a pocket in the top plate of the machine, thus preventing the lever from returning to its normal position, or completing its reverse stroke until the dog is raised by the plunger of the indication solenoid. At the same time a notch in the slide is brought over the plunger of the safety coil and the contacts on the safety spring mounted on the controller, the two second described above, will be opened. Further movement of the lever will cause a knife-switch to snap over by means of its toggle spring, completing the circuit from main battery. The current divides, one part going through a fuse and a low resistance winding of the safety coil and the other through a high-resistance winding without a fuse. This causes the plunger of the safety coil to rise into a notch in the slide and hold the lever immovable until current has ceased to flow when the switch has completed its stroke. Both paths unite again before reaching the lever contact. The circuit is then complete through the reverse-operating wire to the switch, and so through motor to common. The first movement of the function closes the normal operating circuit, which is now open at the machine contact. As the switch completes the stroke the motor is cut out and a magnetic brake stops the motor. At the last part of the stroke, and after the switch is locked the indication contact at the switch is thrown over by its toggle and connection made to common. This completes the indication circuit from common, through indication wire, and indication coil to battery. Current passing in this circuit raises the plunger of the indication coil which lifts the indication dog, permitting the lever to complete its stroke. During this last part of the movement the indication contacts at the machine are reversed, ready for the next normal indication.

Protection against crosses is afforded by connecting the control wire, which will be used in the next operation of the switch, through a contact on the lever of the machine to a "safety bus-bar" through the coils of a relay. There is one relay for each lever. Should a cross occur current would flow in two directions: one through the motor to common; one to the machine through the safety relay of the function in question, bus-bar and all other safety relays connected to the bar, to common through all the motors in parallel. This would energize the safety relay. When the relay picks up it puts a short-circuit on the battery, thus causing the automatic cut-out to operate.

The control, indication and safety circuits for signals are substantially the same as above described for switches, except that, as before noted, besides the common there are but two wires to a signal, viz.: reverse control and normal indication. It is not deemed necessary for a signal to indicate reversed and, as in other systems, signals are pulled to stop by the action of gravity.

The names of the parts shown in the diagram of circuits are:

a Motor armature.
b Reverse field.
c Normal field.
d Reverse contact operated by motor at end of stroke.
e Normal contact operated in same way.
f Reverse indication contact operated by lever at end of stroke after indication has been received.
g Normal indication contact operated in same way.
h Movable part of *f* and *g*.
k Normal indication contact at switch, closed at end of stroke.
l Reverse indication contact.
m, *n* Reverse safety contacts in machine, operated by lever.


To second switch lever.
Common
To armature of other safety magnets
Bus Bar for 8 Functions
To second bus bar connected to 8 functions

Federal Electric Interlocking Machine-Circuits.

o, *p* Normal safety contacts as above.
q Normal operating contact operated by lever.
r Movable part of *q* and *s*.
s Reverse operating contact operated by lever.
t High resistance of safety coil.
u Low resistance of safety coil.
v Indication solenoid.
w Sliding bar attached to lever; has notches for plungers of safety and indication magnets.
x Fuse.

y Lever.
z Quadrant.
A Vertical rotating portion of lever, carrying contacts.
B, *B*¹ Safety relay.
C Secondary safety relay.
D Battery.
E Fuse, 45 amp.
F Fuse, 45 amp.
G Fuse, ¼ amp.
H Automatic cutout.
I Resistance of 750 ohms. When the cutout operates, sufficient current will pass through *I* to hold signals clear, provided they have already been cleared, but not enough to operate any function.
L Movable part of normal safety contacts.
N Movable part of reverse safety contacts.

FREIGHT CLAIM DEPARTMENTS.

BY W. L. SCHNEIDER.

One of the important objects of railway work is to so systematize the method of handling matters brought before the several departments for consideration as to derive the best results with the least clerical work and expense. Therefore, taking this as an argument unquestioned, and dealing with freight claim departments exclusively, experience and observation have impressed upon the writer most forcibly that this branch of railway service is not keeping pace with the times.

It is a fact generally recognized by those familiar with the conditions that railways spend too much money in handling and settling freight claims arising from loss and damage. The writer is fortunate in having had a general railway experience, and may claim a certain familiarity with this subject from a practical standpoint.

The reports of any of the trunk lines will show annual expenditures of from one-quarter to one-half million dollars in the adjustment of loss and damage claims. As this paper seeks to deal only with the question of goods going astray during transportation, we can safely estimate one-third of above figures as a conservative loss due to this cause. From the same authorities it will be found that the amount realized from the sale of freight unclaimed, etc., covered by the different causes given, will not exceed one-tenth of the loss estimate. A casual glance at the figures of any railway at the present time will show the conditions.

When one considers the amount of over and unclaimed freight that is annually brought to the various storage houses for sale—other disposition not being found—it is clearly evident that there is something radically wrong with the manner of handling freight of this nature.

The owners of such property invariably enter claims against the transportation lines for reimbursement, many of which are immediately paid as a matter of policy; and it is safe to say that no railway officer in charge of freight claim work is fully satisfied with the results obtained under present systems.

From the viewpoint of the business man this is a decided reflection upon claim departments, and indirectly upon the management of railways where such a situation obtains. Why is this condition allowed to continue. Extreme conservatism and prejudice toward changes and innovations are believed to be the cause of much of the trouble. Many claim officers are content to let well enough alone; hence no change for the better.

Summarizing briefly the present manner of handling over and unclaimed freight, tracers and claims, it is found that goods which have lain at freight stations for 60 days or more are forwarded periodically to the various storage houses, there to be sold under the hammer, and, consequently, at a considerable loss to the railway, which, in most cases, pays claims of this nature without murmur, acknowledging, by so doing, its inability to control the situation.

In handling tracers and claims line tracing is frequently resorted to in cases of importance when they do not yield to treatment after the forwarding, transfer and delivery points have been asked to show their records and are found wanting. By line tracing is meant that frequently all agents on one or more divisions are called upon to advise by this means whether or not they have any account of certain shipments in question; oftentimes of a very insignificant nature and value, but which, nevertheless, are invariably covered by claims for full valuation. In many cases the trace papers come back to the claim department without having attained their purpose, after having consumed valuable time in fruitless search. If the shipper, consignee or claimant, as the case may be, has been patient, the papers are again started on the road (or filed) with a forlorn hope that something may develop this time, and a month or two more is consumed. If trace papers have been filed the chances are the claimant will be promptly paid upon presentation of claim later. It is also a fact that claims are frequently paid without due investigation, it being deemed the wiser policy to pay the claims and thus retain the good-will of the claimants than to earnestly endeavor to locate the missing shipment.

It is often the case that trace and claim papers go astray in the course of investigation, making it necessary to ask an extension of time of the claimant until a new set can be gotten under way, at the end of which he will be ready to divert his shipments to other lines, and justly so.

Station agents have not the time at their command to give tracers, claims, etc., the attention they deserve, and the strong point of the agent is to get the papers off his hands and into those of the next agency, who has more time to look into such matters. This careless method of dealing with inquiries of this kind frequently results in the lost shipment being passed on the route of the tracer for it, and is allowed to remain in the freight house until the specified time for its removal to the storage room shall have passed.

Not the least disagreeable feature of delays and losses of freight is the fact that the claimant's books are kept open by reason of the non-settlement of these affairs, many considered petty; and railway soliciting agents can testify to the important part borne by these claims in the matter of securing traffic. Any reputable business man would much prefer to have his shipments delivered and received promptly and in good order than to secure reimbursement therefor of a railway by reason of loss. His relations with his customers are oftentimes greatly disturbed because of the non-delivery of goods, and the possible loss to him cannot be compensated for by the transporting line through the mere settlement for the goods.

It may and will be argued by some officers that small and insignificant claims would not justify extensive handling, and that it is the better policy to pay them after it has been reasonably established that the goods were shipped but did not reach destination. It need only be mentioned that most claims are comparatively small, but the total expenditures will show, in a measure, how it pays the railway companies to settle such matters upon the basis that they are too trivial to spend much time in their investigation.

From the foregoing comment it will be seen that by handling tracers and claims for lost shipments entirely by clerical work and mail the results are not what they should be. It will readily be admitted that personal attention and investigation of any matter is generally followed by much better and more satisfactory results than when the same case is taken care of entirely through the medium of the mails.

Some railways use their detectives or police in this work of locating astray goods on the theory that they ought to be fully as capable in tracing such shipments as in locating stolen goods. This is a plausible theory and works to a certain extent; but it is well-known that there is a deep-rooted antagonism between railway police and other employees of the service which prevents the close co-operation that should exist. It is to be regretted that such is the case, but every intelligent railway man acquainted with the situation will bear out the statement that such a feeling does obtain. How-

ever, even under the most favorable circumstances the police could handle but a few of the tracers and claims covering the more valuable consignments, and that leaves much to be desired. Furthermore, to take an officer from his police duty to enter the field of freight work is to lessen his efficiency in his proper sphere.

As has been said, personal attention will accomplish far more and with less expense than by the ordinary channel of correspondence, and the writer feels that a better method of bringing the shipments short or over in touch with the trace and claim papers is needed.

To this end it is suggested that traveling agents be appointed whose exclusive business it shall be, for a time at least, to cover every point of a railway and ascertain beyond doubt and question just what over and short shipments may be charged against the stations. A complete alphabetical record should be kept by them of all such shipments, which can very easily be done by means of a memo. book suitable for the purpose, showing description of goods, how long short or over, on what billing and such other information as the situation may suggest.

There appears to be no reason why such a method should not be of material assistance to station agents. They could acquaint the traveling agent with their shortages, etc., and he, making a proper record of same, might, with a reasonable degree of certainty, locate such shipments at another station. It is firmly believed that station agents would give their hearty co-operation and welcome such a plan of investigation, as it would give them the assistance of one whose duty it was to give such matters his undivided attention, and, besides, would remove, to a great extent, the present haphazard manner of tracing.

The difficulties attending the inauguration of this scheme are not underestimated in the least, and hard, conscientious work would be necessary to establish a basis; but the writer has no fear of the outcome if the plan is given a thorough and intelligent trial. This is the age of specialization, and too much stress cannot be laid on the matter of giving these agents no other duties in connection with this work. Traveling auditors, contracting freight agents, trainmasters and others cannot handle this question as a side-line and do justice to it.

I believe that the claim office forces and other large freight offices could be drawn upon for men to engage in this work without increasing the expense materially.

After the plan is put into operation it might be arranged that the time of continuous travel of these agents be limited to two weeks or one month, this, of course, depending largely upon the number of men performing this work and the territory to be covered. Existing conditions would govern the details of operation.

Their instructions should recall them to headquarters after the specified time of road work shall have been consumed. It is understood, of course, that the freight claim department will pay no claims of the nature under consideration until these agents shall have had an opportunity to compare them with the information gathered on the line.

After making such comparisons they might also get in touch with the active trace and claim files and give the office force such assistance as may rest in their power.

It may be argued that this innovation would impede the office work. The writer admits that some readjustment to the new conditions would be necessary in the routine of the department, but the introduction of this new element in the work, bringing it out of the rut in which it has so long been confined, would give this branch of the service an impetus such as it had not known in the past.

Let it not be understood that it is claimed this manner of handling would render tracing by mail unnecessary; that is absurd on its face. Tracing will always be necessary, but the scale on which it is now carried is unreasonably extensive, and in comparison therewith practically barren of results. The plan as given in the foregoing lines is crude and incomplete; but its intention is rather that of an outline of a policy which can, under proper handling, develop the ideas into tangible and substantial form, and the benefits to be derived will, it is believed, justify its trial.

TRAIN ACCIDENTS IN MAY.[1]

Following is a list of the most notable train accidents that occurred on the railways of the United States in the month of May, 1909. This record is intended to include usually only those accidents which result in fatal injury to a passenger or an employee or which are of special interest to operating officers. It is based on accounts published in local daily newspapers, except in the cases of accidents of such magnitude that it seems proper to write to the railway manager for details or for confirmation.

Train Accidents in the United States in May, 1909.

Collisions.

Date.	Road.	Place.	Kind of Accident.	Kind of Train.	No. persons reported Kil'd.	No. persons reported Inj'd.
3.	Bos. & Maine	Portsmouth.	xc.	P. & Ft.	1	3
*3.	Gt. Northern	Delano, Minn.	rc.	P. & Ft.	0	20
15.	Gt. Northern	Mead, Wash.	xc.	Pass.	0	12
25.	N. Y., P. & N.	Salisbury.	xc.	P. & Ft.	1	2
31.	At., T. & S. Fe	Peabody.	xc.	P. & Ft.	1	2

Derailments.

Date.	Road.	Place.	Cause of derlmt.	Kind of train.	No. persons reported Kil'd.	No. persons reported Inj'd.
*5.	Balt. & Ohio	Romney.	acc. obst.	Pass.	0	6
9.	St. L. & San F.	Springfield	washout.	Pass.	1	5
11.	Mo., K. & Tex.	Bonita, Tex.	unx.	Pass.	3	22
14.	Wabash	Randolph.	d. bridge	Pass.	0	12
15.	Chic. & Alton	Odessa.	unx.	Pass.	0	30
17.	Chic. & N. W.	Mason City.	unx.	Ft.	1	2
20.	St. L. & S. F.	Vinita.	unx.	Pass.	1	7
23.	Gt. Northern	Cascade, Mont.	washout.	Ft.	1	2
25.	Cent. of N. J.	Slate Dam.	unx.	Pass.	0	0
29.	Mob., J. & K. C.	Mobile.	washout.	Ft.	3	1
30.	Central Ga.	Martindale.	unx.	Pass.	0	7

One of the most serious accidents in the foregoing list is that which occurred near Mobile, Ala., on the twenty-ninth—next to the last derailment. An engine of the Mobile & Ohio, with a caboose, was running over the Mobile, Jackson & Kansas City on account of a break in the roadbed of its own line, and it was wrecked by a flood on the M. J. & K. C. One of the men killed was a conductor of the M. J. & K. C. who was acting as pilot. The wreck was partly submerged in the flood, the engine being overturned.

In the derailment at Slate Dam on the twenty-fifth, five passenger coaches were ditched and a sixth was overturned. The train derailed near Mason City, Iowa, on the seventeenth consisted of an engine alone; and of the three men on it, one was killed and the other two were seriously injured. The engine was on its way to relieve a disabled freight train, and appears to have been derailed while running at good speed on a curve.

The collision at Mead, Wash., was caused by train robbers. The robbers had detached the engine and mail car from a passenger train and had run them some distance ahead; and after finishing their robbery they started the engine and car back toward the train, unattended. The injuries to passengers were mostly caused by flying pieces of glass.

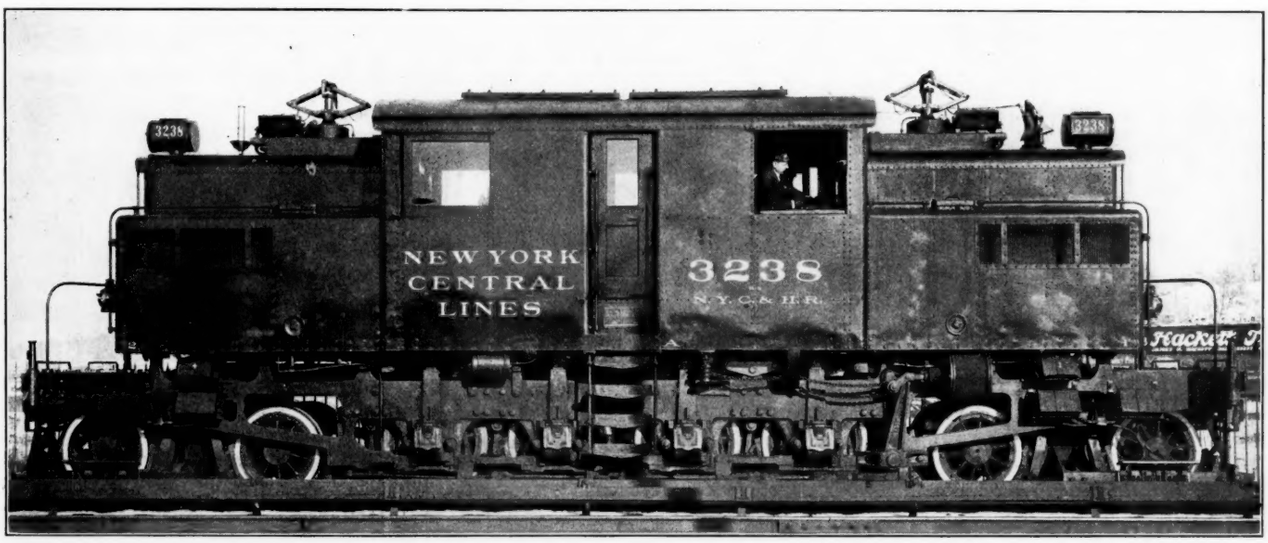
In the derailment near Bonita, Tex., on the eleventh, all of the coaches but one were ditched. The despatch gives no hint of the cause of the derailment except to say that the train was running at high speed and that the engine was the first to leave the track.

Of the eight electric car accidents reported in the newspapers in the month of May, one, a derailment at Memphis, Tenn., caused the death of one passenger.

[1] Abbreviations and marks used in Accident List:
rc, Rear collision——bc, Butting collision——xc, other collisions——b, Broken——d, Defective——unf, Unforeseen obstruction——unx, unexplained——derail, Open derailing switch——ms, Misplaced switch——acc. obst., Accidental obstruction——malice, Malicious obstruction of track, etc.——boiler, Explosion of boiler of locomotive on road——fire, Cars burned while running——P., or Pass., passenger train——F., or Ft., freight train (includes empty engines, work trains, etc.)——Asterisk, Wreck wholly or partly destroyed by fire——Dagger, One or more passengers killed.

NEW YORK CENTRAL ELECTRIC LOCOMOTIVE.

The direct current electric locomotive built for the New York Central & Hudson River was illustrated and described, as it was originally put into service, in the *Railroad Gazette* of June 15, 1906. During the endurance tests and afterward on the road some peculiarities developed that led to a modification of the first design, and changes have been made which have materially increased the efficiency of the machine. For example, with the two-wheeled trucks at each end, there was a tendency to nose at high speeds, by which excessive stresses were undoubtedly put upon the track. The rigidity of the driving wheels in the frame also added to this same effect. This action rarely occurred at ordinary running speeds of from 50 to 55 miles per hour, but when this was increased to 65 miles or more, the nosing frequently developed. In order to overcome this tendency, the wheel base has been made flexible and four-wheeled trucks have been added at each end. There is also a change in the equalization of the running gear. In the locomotives, as first built, the two-wheeled truck at each end was equalized with the two adjacent pair of driving wheels, thus making two sets of equalizations for the engine. By cross connecting the diagonal truck equalizers at one end, a three-point support for the locomotive was obtained.



New York Central Electric Locomotive.

With the use of a four-wheeled truck at each end, it was necessary to take some of the weight from the driving wheels and put it on the truck, although the total weight of the engine was increased by the addition of a heavy center plate for the truck. The use of the four-wheeled truck has also necessitated a change in the wheel-base as well as in the general arrangement. In the first engines, the driving wheel base was 13 ft., making a spacing of 4 ft. 4 in. between wheel centers. The total wheel base was 27 ft. With the four-wheeled truck, the driving wheel base has been maintained at 13 ft., but the distance between truck center pins has been increased to 30 ft. and, this with a truck wheel base of 6 ft., makes the total wheel-base of the engine 36 ft.

The system of equalization has also been changed. Instead of equalizing the truck with the two adjacent pairs of driving wheels as in the first engine, one truck is equalized with the end pair of drivers next it, and the equalization for the other truck extends through the remaining three pairs of drivers. This was done to retain the three-point suspension for the locomotive. At the end where but one pair of drivers is equalized with the truck, the two diagonal equalizers are themselves carried at their fulcrum points by cross equalizers, upon which the frame is carried, the support being at the center line of the engine.

Greater flexibility of the engine on curves was obtained as the result of some experiments made at Schenectady. In order to ascertain the lateral thrust of the wheels against the rail, the flanges of the axle box shoes were cut away so as to allow a play of ⅜-in. or more between them and the pedestals. They were then held in place by helical springs, the deflection of which indicated the thrust. It was found, however, that this arrangement gave such a very flexible and accommodating wheel base that the engine could readily run into a siding curve of 24 deg., while the wheels of an ordinary Atlantic locomotive would begin to lift from the rails before the truck wheels had reached the frog point. These springs have, therefore, been retained as a part of the regular equipment of the locomotive. In applying the springs, studs are screwed into the pedestal legs passing through the outside flanges of the shoes. A cap and nut at the outer end serves to so adjust the tension of the spring that the shoe is pressed firmly against the outside face of the frame. When, however, any excessive outward pressure is brought against the box, the spring yields and the necessary flexibility is given to the running gear. The springs are placed on each side and act in opposite directions, so that the movement can take place either to the right or left.

These changes have required considerable lengthening of the frame. The frames of the first locomotives had an overhang of 10 ft. outside the driving wheels at each end, making a total length of 33 ft. The revised frame has a total length over all of 40 ft. 3 in., or with an overhang of 13 ft. 6¾ in. to the face of the end plate. The dimensions of the old parts have been retained, with the exception of the lower rail of the extension, which is subjected to compression stresses, the depth having been increased from 2½ in. to 4½ in. The frame is made of cast steel, as were the old ones, and there are slight differences of shape on the two sides in order to meet detail requirements for attachments.

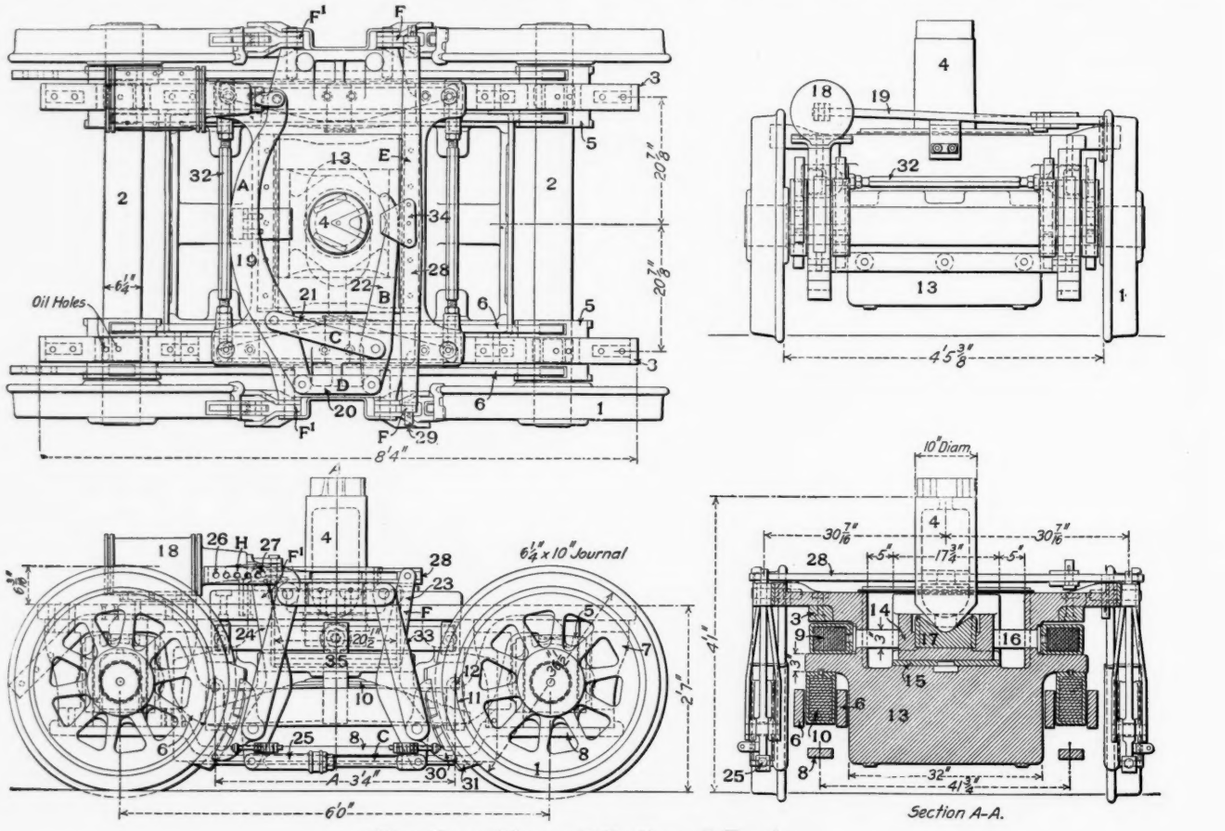
The truck is of the four-wheel design, similar to those previously built for heavy electric car work and locomotives. It is built up of a 2½-in. x 4-in. top rail, heavy pedestals bolted in place, with a stiff pedestal tie bar at the bottom of the legs. It has the usual inside bearings of locomotive trucks and in this it varies from the driving wheels, whose bearings are outside. One peculiarity of the truck is the exceedingly heavy cast transom. It is bolted to the side frames and has a deep center dropping down to within 4½ in. of the top of the rail. It is 32 in. wide and 53 in. long, and carries the center bearing

on its upper surface. The reason for this feature of the design is to place sufficient load on the truck to hold it to the rails and at the same time, to avoid taking any more weight from the drivers than is absolutely necessary.

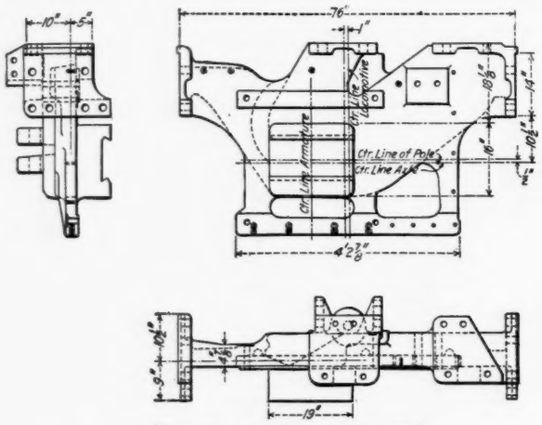
The load is applied through the equalizers to the top of a long center pin. The equalizer is a hollow steel casting having a pointed lower end resting upon the truck center plate. Between the bearing point and the truck center plate, the equalizer passes through a center pin guide bolted to the framing, and this serves to hold the truck in place. The truck center plate is held in position laterally by elliptic springs on each side. In order to check the tendency to nose, and avoid the resulting shocks, the whole is carried on a wearing washer of fiber that sets directly on the heavy cast transom.

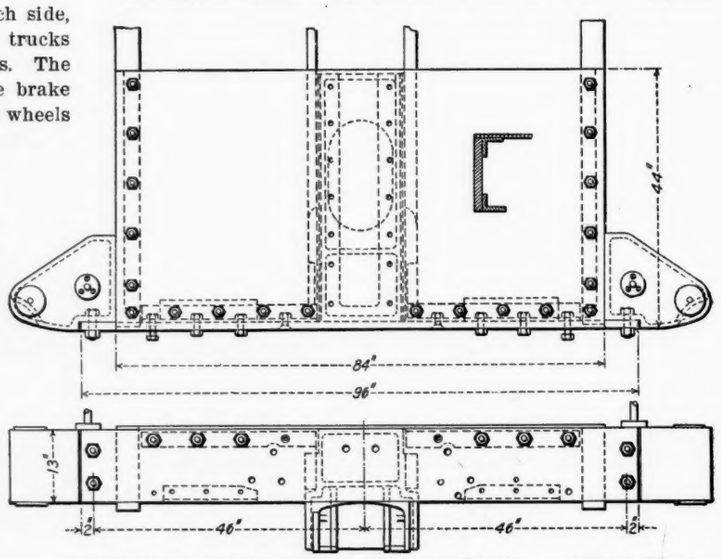
The weight is carried by semi-elliptic springs on each side, hung between equalizers in the usual manner. The trucks have their own foundation brake rigging and cylinders. The latter are the 8-in. x 12-in. Westinghouse design. The brake rigging is of special design, since the space between the wheels is almost all taken up by the heavy center transom. The cylinder is located at the top and to one side of the truck. The cylinder lever runs across back of the center plate and above the frames. Following out these connections: the piston bears against the outer end of the lever A. This is connected to the lever B by the bars C and D, as D is fixed, the cylinder thrust is taken by C and communicated to the brake-beam E. This brake-beam has trunnions at each end that engage the upper ends of the live brake levers F, which are pinned to the brake-heads and are connected to the dead levers F¹ by the thrust rods G. The adjustment for the wear of the shoes is made in the usual manner by pins in the upper end of the dead lever and the dead lever guide H.

The driver brake rigging consists of the interfulcrumed



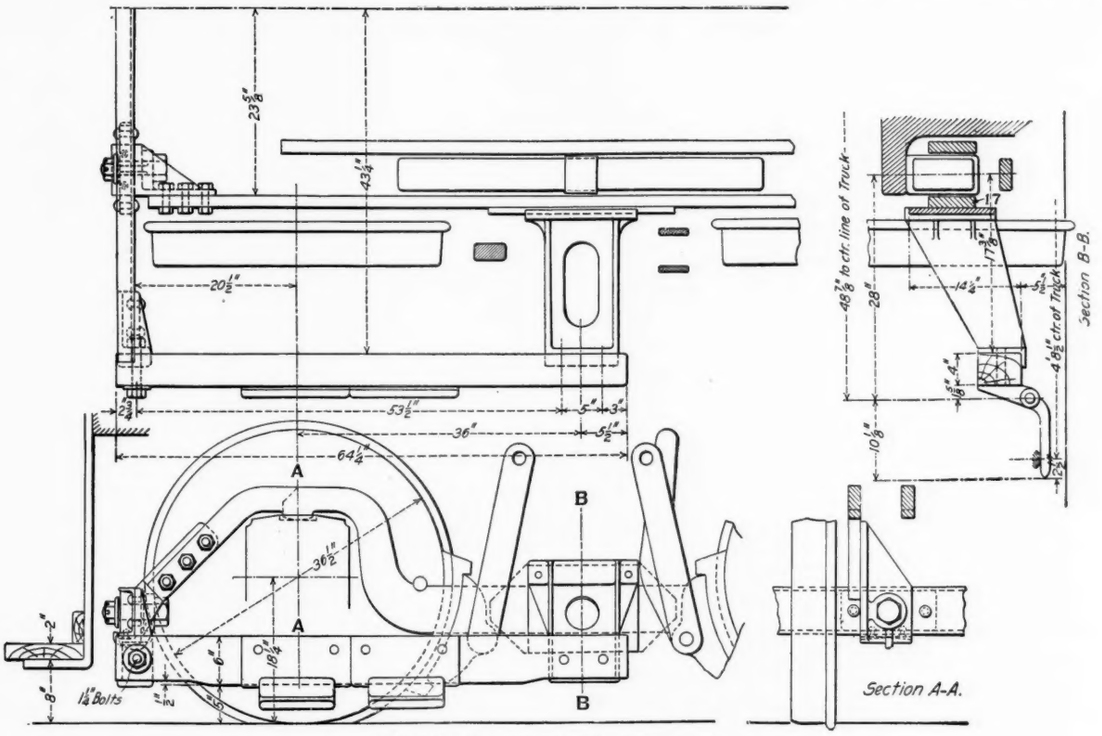
Elevations, Plan and Section of Truck.





equalized driver brake, made by the American Brake Co., St. Louis, Mo. There have also been a few minor modifications in the driving boxes, although they are essentially the same as when at first designed.

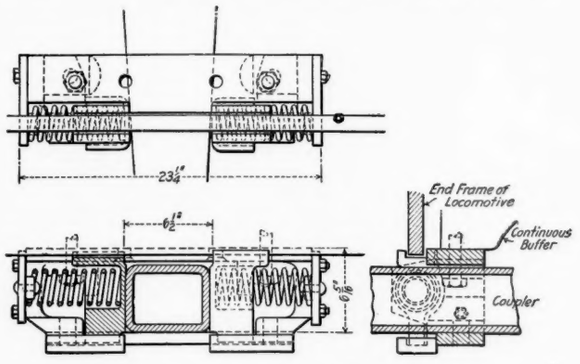
With the use of the four-wheeled truck, the method of supporting the contact shoe was changed and it is now carried on the truck instead of from a special frame fastened to the



Third-Rail Contact Shoe Support.

axle boxes. The outside equalizer on each side is extended out beyond the axle box and down on a slope to a point about flush with the tread of the wheel, where a cast bracket is bolted. To it is fastened a 6-in. I-beam, extending across from one side to the other, which serves to hold the timber which carries the shoe castings. The inner end of the timber is carried by a bracket bolted to the equalizer on the line of the center pin. The shoe is thus kept below the springs and at a constant height above the rail.

The frame transoms, or cross-ties, form, at the same time,



Draft Rigging Centering Device.

the field magnet core. It is a steel casting and is bolted to the inside faces of the frames, with a lip over the top to take the shearing stress from the bolts. The core has a soft iron pole face held by the dovetail in the face of the core.

With the lengthening of the frames and the application of the four-wheeled truck, the construction of the end bumper has also been changed. In place of the cast steel design originally used, one of built-up type has been substituted. A steel plate ⅜-in. thick and 44 in. wide x 84 in. long is laid on top of the frames in front of the cab. The end plate is 1¼ in. thick and 13 in. wide, reaching across the end of the machine to a point 6 in. outside the side frames. Here it is bolted to a strong corner casting which is bolted to the frames. At the center, there are two bars, 6 in. x 2 in., set 15 in. apart, that extend back to the transom and which serve the same purpose as the center or draft sills of a car. The space between these is filled by a casting, which serves not only as a means of fastening the end plate to the center bars, but also as a point of attachment for the Gould friction type draft rigging. The end plate is connected to the cover sheet throughout its entire length by 3-in. angles bolted to the former and riveted to the latter with countersunk rivets.

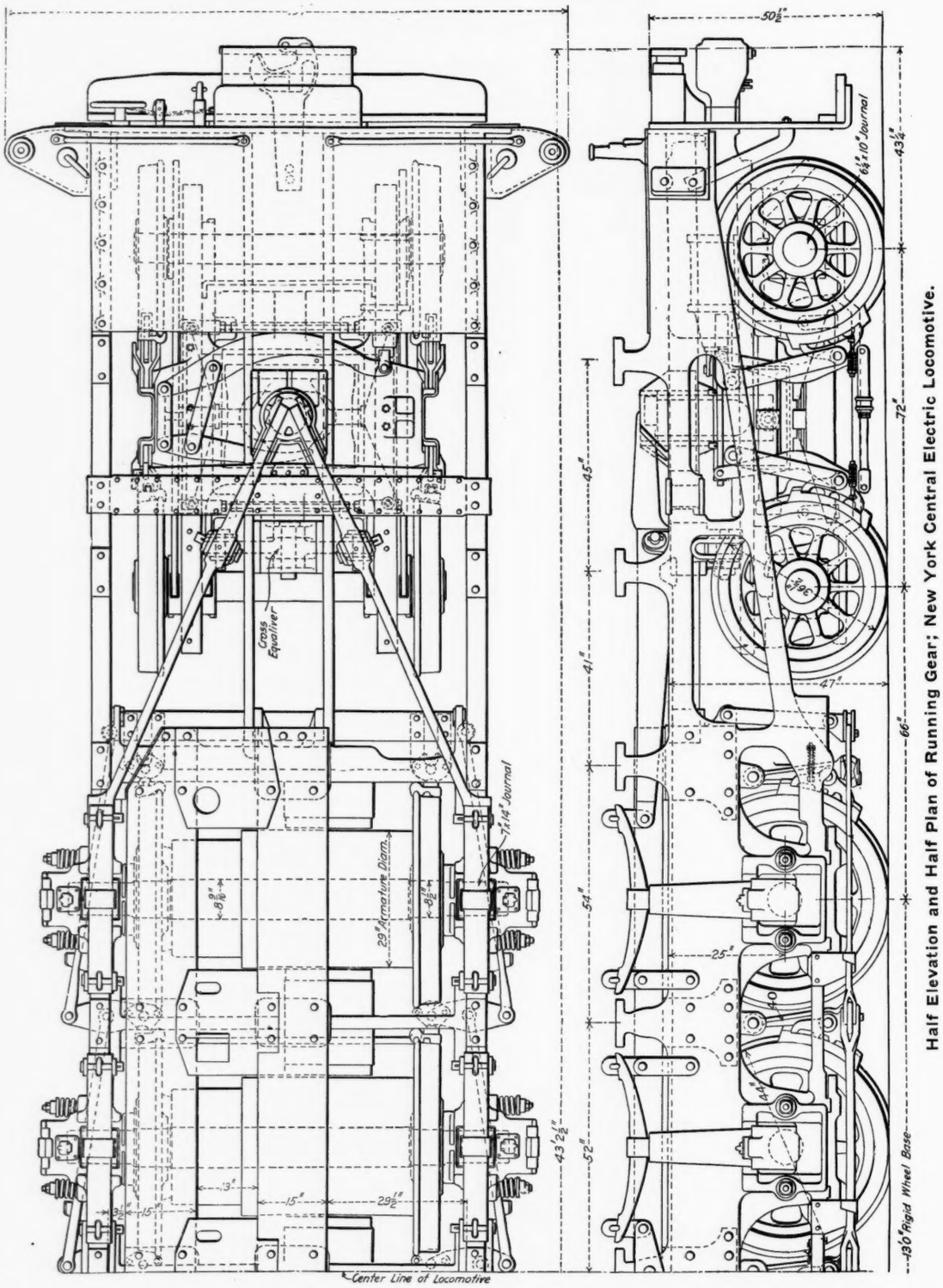
In the original locomotive, the centering device for the draft rigging consisted of a single long spring, set above the coupler shank and confined by the carry iron. A connection was made with the shank by a stirrup straddling it, also with upwardly projecting lugs having bearing on the spring caps, which could move inward only. One spring, acting under compression, served always to move the coupler toward the center. This arrangement has been changed for the one shown. In this, two springs are used, are set on the center line of the drawbar, bearing directly against a slide in contact with the shank. A strap bolted, across their ends, to the carry iron castings, holds the springs in place. This change was made necessary after abandoning the cast steel buffer beam and the substitution of the bars and filler now used.

The hand brake, located within the cab, has the coned, helical winding spool at the lower end of the brake staff, so that an increased pull is obtained with the same effort at the brake handle as the chain is wound up. In addition to this, the pull is doubled by passing the chain through a movable sheave on the brake connection and fastening the end to the floor timbers.

The pantagraph has also been modified. Air pressure is used for raising and lowering the shoe for the overhead contact. The arrangement is shown on the accompanying drawings. The shoe (2) is carried at the upper ends of the knee-joint levers, which have their lower ends pivoted on the cylinder

or base casting (1). These levers also extend in from the pivotal point and are connected at their extremities to a trunnion pin attached to the lower part of the plunger. The weight of the shoe and levers tends to raise this plunger and unless it were held down, the shoe would fall away from the overhead rail. It is held down by the spring above it, against which the piston acts. The latter is fitted with the usual leather packing and follower. When compressed air is admitted above the piston, it, with the spring and plunger, is pushed down and the shoe is lifted to a contact with the overhead conductor, and can accommodate itself to inequalities of surface and of height. On exhausting the compressed air, the shoe drops away from the contact rail. The electric connections between the shoe and the base or cylinder are maintained by the shunt (3). The range of lift of the shoe is from 1 ft. 9 in. to 2 ft. 7 in. above the base of the cylinder.

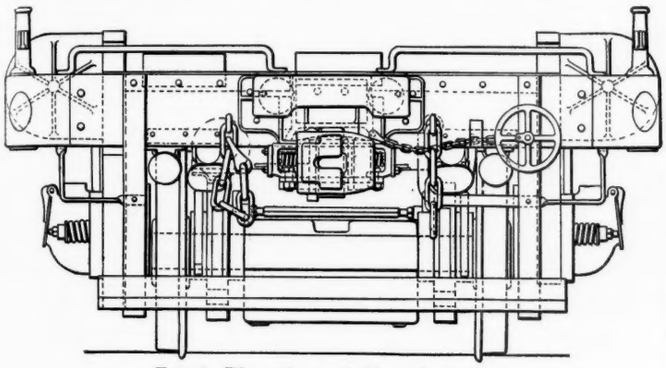
The cab remains of practically the same dimensions as at first, having been lengthened but 4 in. The principal change is in the roof hatches. On the first locomotive there was a single hatch at the center with an opening of about 40 in. along the axis of the engine. The roof has been cut away so that now there is a 11-ft. opening, closed only for a distance



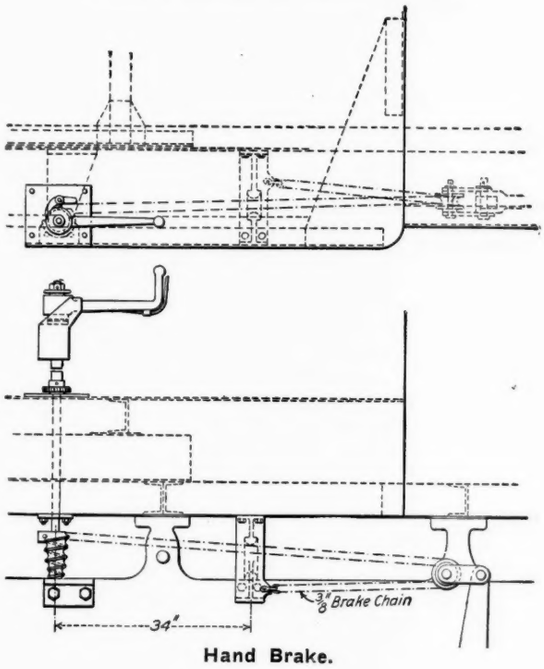
Half Elevation and Half Plan of Running Gear; New York Central Electric Locomotive.

of 7½ in. at the center by the carline angles. The hatches themselves are closed by covers built up of angles and a plate curved to the form of the roof.

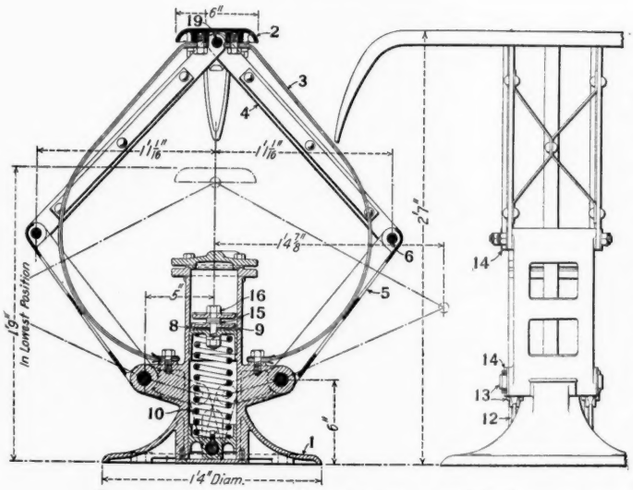
Of the minor details of the cab, the ends doors and lookout window have not been illustrated before. The door is of wood with a bottom panel of steel, ⅛-in. thick. The top panel is formed by a sliding sash with glass that can be raised and lowered and set at any desired height by ratchet locks on either side. The Yale lock is used and a latch that is lifted by a handle on both sides of the door. The lookout window is not only hinged as a whole, but has a swinging sash that can be turned, opened and set in any position independently of the window. The sash closes against the stop plate on the outside of the cab and is held firmly in place by the handle H, forming a nut that can be tightened on a swinging bolt, which fits in the open jaw of the clip B. The swing sash is turned and held by a slide that can be moved and locked at any desired point on a round guide, similar to the front doors of a cab on a steam locomotive.



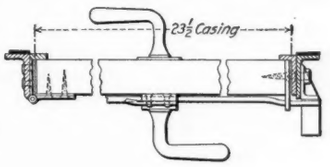
Front Elevation of Running Gear.



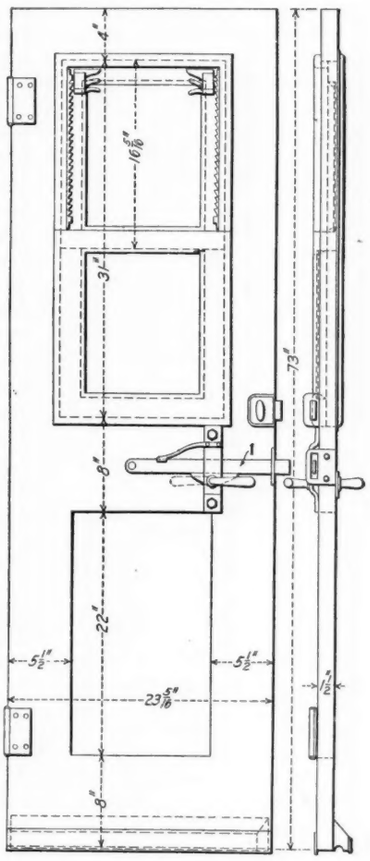
Hand Brake.



Pantagraph or Overhead Trolley Contact.



Other details, minor in themselves, but of vital importance to the safe operation of the locomotive, are the commutator shields and the magneto shield. The commutator shields are fastened to the bottom portion of the transom castings in a way to be readily removed for inspection and care of the motors which they protect, as shown in the accompanying illustration. A shield consists of a plate with a lip casting on one edge that hooks over a corresponding lug riveted to the transom. By loosening one edge, the other is readily removed. The magnet shield consists of a simple plate, bolted to the bottom of the transoms. It is 17 ft. 11½ in. long over all, and extends the whole length beneath the motors. This prevents the magnetic attraction of the motors from picking and drawing up into the moving parts, spikes, iron or steel tools that may be lying between the rails.



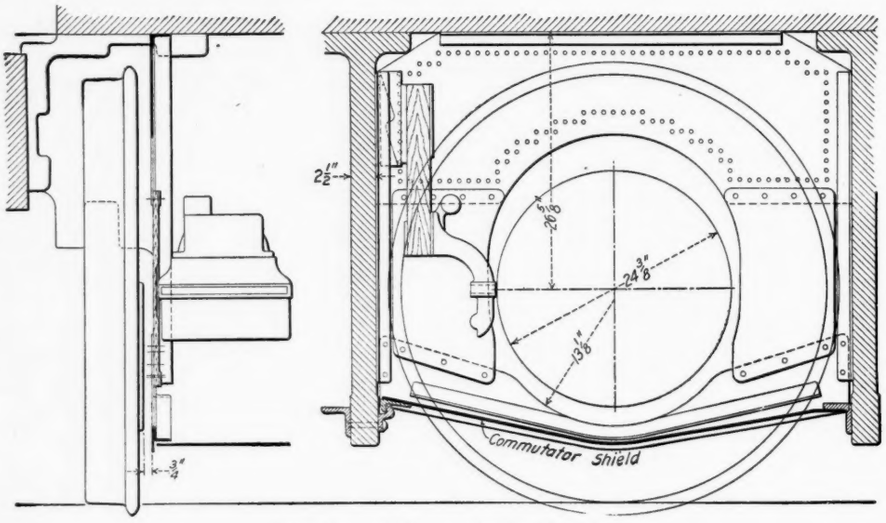
End Door.

That there is a strong magnetic force in action whenever the motors are at work is, of course, evident, and the rapidity with which it acts is shown by the fact that a track wrench or spike lying on the ties between the rails will be picked up and held against the magneto shield until the current is shut off, even though the machine may be moving at as high a speed as 65 miles an hour. At this speed, the length of the shield will be traversed in .19 of a second, so that the articles have to be magnetized and lifted about 9 in. in that time. Finally the pilot has been removed and a foot-step put in its place.

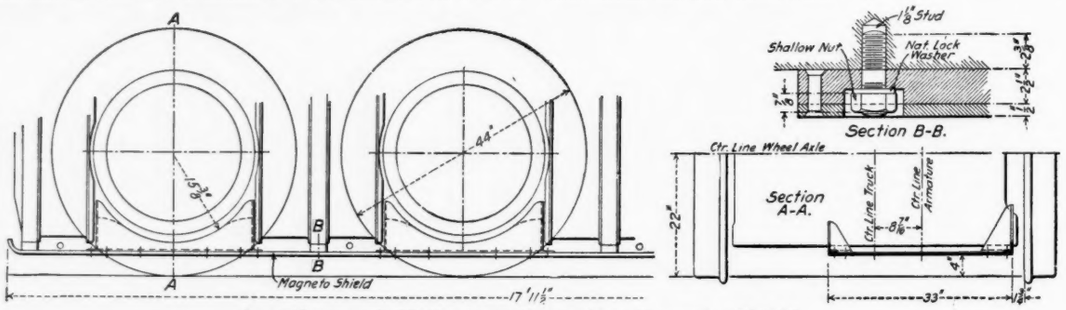
If a comparison be made between these and the first locomotives, it will be seen that the changes made are all those of apparently minor details and yet it was necessary to do this in order to obtain entirely satisfactory running conditions. The principal difficulty that was experienced at first was the moving at high speeds on tangents to which reference has already been made. The efforts of the engineers were first

directed toward this end. The substitution of the four-wheeled for the two-wheeled truck and the use of a center plate, offering some frictional resistance to turning, seems to have accomplished this, so that now the machines are said to run as steadily on a tangent at speeds of 65 and 70 miles an hour as they do at 45 miles, at which latter speed there never was any trouble even with the early locomotives. As to what the lateral action of these locomotives upon the track may be no information is available, nor is there any in existence. That the stresses so imposed are considered to be of some magnitude is evidenced by two things: first, the maximum speed in the electric zone is limited to 40 miles an hour, and second, the condition and construction of the track. Probably upon no other section of railway in the world is the surfacing and maintenance of the track kept so nearly perfect as it is upon that where these engines are operated; and, as for its strength it is as strong as human ingenuity can make it and probably the strongest in existence.

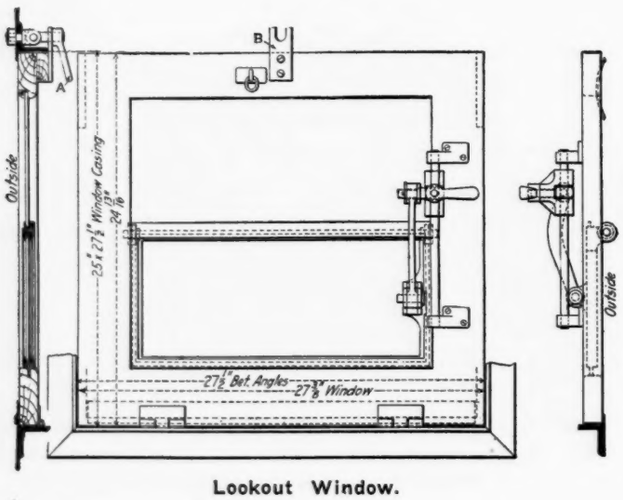
That these lateral stresses are rather severe seems evident from the construction of the machine. In the first place, the center of gravity is very low. Each pair of driving wheels, with its motor weighs about six tons and the center of gravity of this mass is but 22 in. above the rail. Then on the truck there is that heavy cast transom and center plate that must weigh at least 10,000 lbs., and whose center of gravity is not more than 14 in. or 15 in. above the top of the rail. These are the heaviest concentrated masses of the locomotive and it is evident that when nosing occurs or when the machine is being deflected on the passage of a curve the lateral stress on the rail must be high, especially whenever the speed exceeds that for which the outer rail is elevated. In addition to this, there must be some stress imposed by the gyroscopic action of the rotating parts, regarding which there are wide differences of opinion, but apparently no definite information. It is, therefore, proper that the officials should pursue the safe course that they are now following until it has been learned beyond all peradventure and independently of mathematical calculations as to just what physical action these engines may have upon the track when running at different speeds over curves of different radii and with a variety of super-elevations for the outer rail.



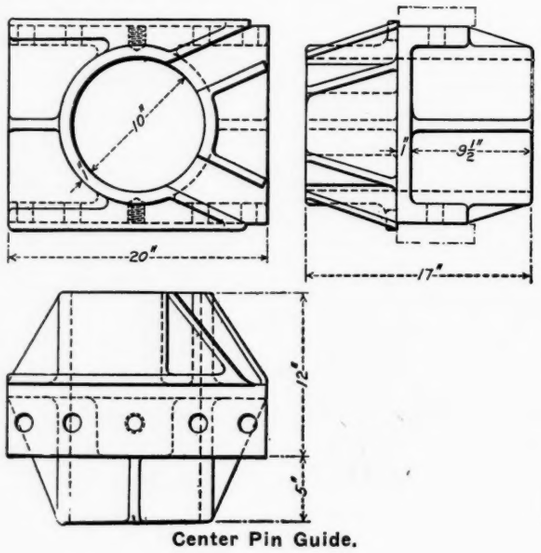
Location of Commutator Shields.



Location and Method of Fastening Magneto Shield.



Lookout Window.



Center Pin Guide.

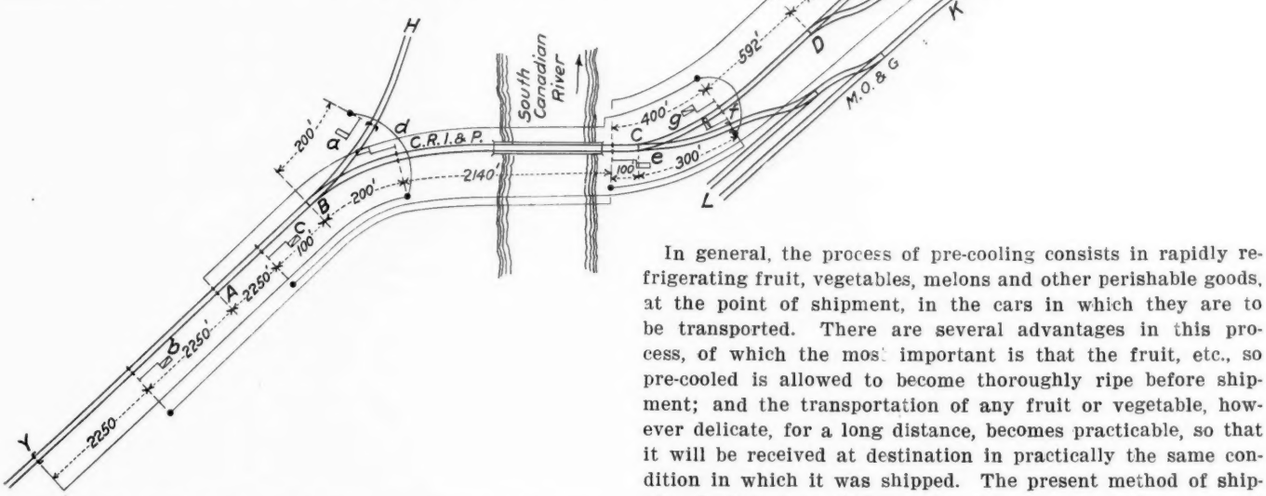
AUTOMATIC JUNCTION SIGNALS AT CALVIN, OKLAHOMA.

At Calvin, Okla., the Missouri, Oklahoma & Gulf, a north and south line, crosses the Chicago, Rock Island & Pacific, an east and west line; and both roads cross the South Canadian river at this point. To utilize a single bridge for both, the M. O. & G. is connected to the Rock Island as shown in the accompanying drawing, and its trains cross the river on the Rock Island bridge. Trains from the north (H) enter the Rock Island track at B, back over the bridge and through switch C to track K, and then proceed southward on track L.

The signaling for these junctions is at present wholly automatic, an arrangement which presumably will be maintained until the volume of traffic is larger than at present. Signals *a*, *d* and *e* give two indications and signals *b*, *c*, *f*, *g* and *h* give three indications, all in the upper quadrant, the last five repeating the indication of the signal in advance. They are all style S, made by the Union Switch & Signal Company.

Two indicators each are provided at switches B and C, and one each at D, E, F and G. The control circuits of the converging signals *a* and *d*, *f* and *g* are selected respectively through circuit controllers on switches B and C. Signals *a* and *f* will not clear unless their respective switches are reversed. The overlaps are so arranged that signal *b* governs to signal *e*, signal *c* to signals *f* and *g*, signal *e* to X, signal *h* to signal *e*, signals *f* and *g* to A, and signals *a* and *d* to Y.

At switch B the eastward indicator will be set at stop by a train between Y and signals *a* and *d*, and the westward indicator by a train between X and signal *c*. At C the eastward indicator will be set at stop by a train between Y and signals *f* and *g*, and the westward indicator by a train between X and signal *e*. The indicators at switches D, E, F and G will be set at stop by a train between A and the switch in question.



Automatic Block Signals at Calvin (Junction) Oklahoma.

Trains of the M. O. & G. must not enter upon the Rock Island track at either switch if either indicator at that switch indicates stop. If both are clear, the trainman opens the switch. Thereby, in the case of switch B, for example, he sets signals *b*, *c*, *d* and *g* at stop; and he clears signal *a*. This also sets signal *h* at caution. In the case of switch C, signals *c*, *e*, *g* and *h* are set at stop, and signal *f* is cleared; and signal *b* is set at caution. Thus in either case full protection for the movement is provided. Rock Island trains from both east and west are governed by the automatic signals.

All apparatus was installed by the Rock Island signal forces. The switch indicators are the Union Switch & Signal Company's upper quadrant semaphore type. Polarized line circuits are used for the control of all of the three-position signals. Track relays are of 4-ohms resistance; line relays of 500 ohms. The Hall Signal Company's type E-B relay is used for the track and neutral line circuits. The polarized line and slow-acting relays are of the "Universal" type, made by the Union Switch & Signal Company. The slots of the signals have a high and a low winding and are not slow acting. Slow releasing relays of 1,000 ohms resistance are provided to hold the circuits closed while the pole changers act.

PRE-COOLING PLANTS OF THE SOUTHERN PACIFIC IN CALIFORNIA.

The Southern Pacific is building in California two plants for pre-cooling fruit preparatory to shipment to eastern markets. The object and advantages of pre-cooling, as well as the experimental work that has been done in the development of processes, have already been described in these columns. However, these points will be gone over briefly again in order that the working of these plants will be understood.

In general, the process of pre-cooling consists in rapidly refrigerating fruit, vegetables, melons and other perishable goods, at the point of shipment, in the cars in which they are to be transported. There are several advantages in this process, of which the most important is that the fruit, etc., so pre-cooled is allowed to become thoroughly ripe before shipment; and the transportation of any fruit or vegetable, however delicate, for a long distance, becomes practicable, so that it will be received at destination in practically the same condition in which it was shipped. The present method of shipping fruit in ice-cooled cars is, of course, a vast improvement on no refrigeration at all; but it is open to the very great objection that the temperature of the car is so gradually reduced by icing that it takes two or three days before the entire contents of the car are cooled down to a point at which decay is arrested, for which reason it is necessary to ship perishable goods in a more or less unripe condition to allow for further ripening in transit. It is evident, therefore, that any process which can greatly expedite the initial refrigeration will permit of the shipment of fruits, melons, etc., in just so much more perfect condition as regards ripeness. This is what pre-cooling does; that is to say, by the use of this method a carload of fruit may be so quickly brought below the point at which decay is arrested that the contents may be fully ripe when shipped, and may be delivered to the consignee in practically the condition in which they are picked.

Besides the element of temperature, the emanations from the fruit itself are aids to decay, and it has been found of great advantage to be able not only to lower the temperature of the contents of the car, but to withdraw therefrom the heated air given off by the contents, which is charged with foul gases and emanations. What is known as the "intermittent" system

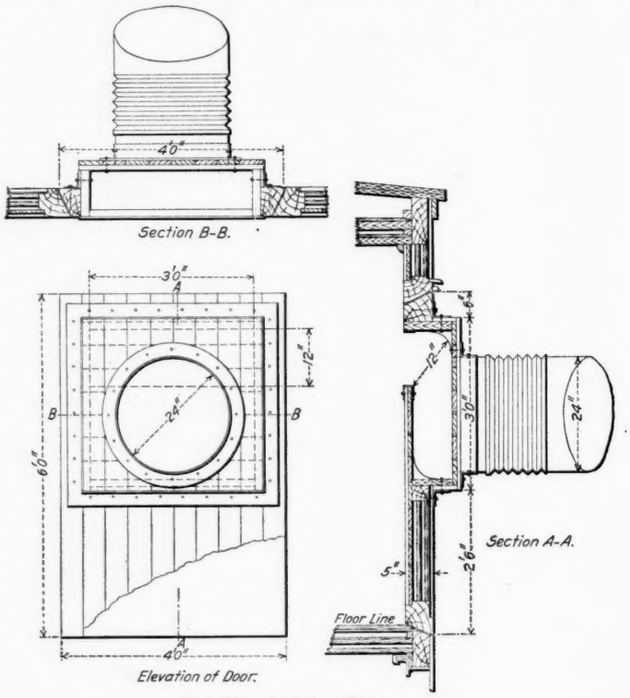
is used by the Southern Pacific, this process being devised to accomplish both refrigeration and purification. The apparatus for this purpose forces air through a false door or other aperture at or near the middle of a car and distributes this air, by means of suitable deflectors and baffles, through the boxes of fruit packed in the car. The cool air passes into the car in a continuous stream, and is withdrawn from the end hatches by means of temporary connections. At suitable intervals the inlet is closed for a brief time and an exhaust maintained in the outlet pipes, so that a partial vacuum is created in the car. During this part of the process the exhausted air is discharged into the atmosphere. Circulation of cold air through the car is resumed by opening the inlet and closing the exhaust to the outer air. The cold air, after circulating through the car, is passed by suitable fans over and through a coil of cooling pipes so as to condense any moisture or essential oils emanating from the fruit which may be left in the air after the vacuum part of the process. The amount of vacuum, the frequency of its application, and the length of time during which it is maintained should vary with the kind and condition of fruit, vegetable, etc. Thus, by this process not only are the contents of the car refrigerated, but they are also surrounded by sweet, clean air, sterilized by refrigeration. After pre-cooling, the cars are fully iced as usual, so as to maintain a low average temperature during shipment. This preserves the delicate flavor of fruits, berries and vegetables shipped for long distances, so that they arrive in a condition not heretofore possible under ordinary refrigerating methods; and there is evidence to show that the contents keep better when exposed for sale than fruit which has been shipped in the ordinary way.

The two pre-cooling plants are being built at Roseville and Colton, the former being near Sacramento and the latter east of Los Angeles. The Roseville plant will take care of all fruit shipments from the northern and central parts of the state, and the Colton plant will serve the great citrus fruit region to which it is adjacent. The Roseville plant will have only half the capacity of the other at the outset. Its capacity can be doubled readily by duplicating the initial installation.

Plans of the Colton plant are shown herewith. The ground plan shows an ice-making plant with a pre-cooling building at each end, a track on each side, and connections for 40 cars. The ice-making plant was already in existence, its capacity being more than sufficient to supply the road's icing needs for this part of the state. Since it produces the most of this ice during the winter months it has been partially idle heretofore during the summer months. Using it in connection with the pre-cooling plant will enable it to be kept busy the year through.

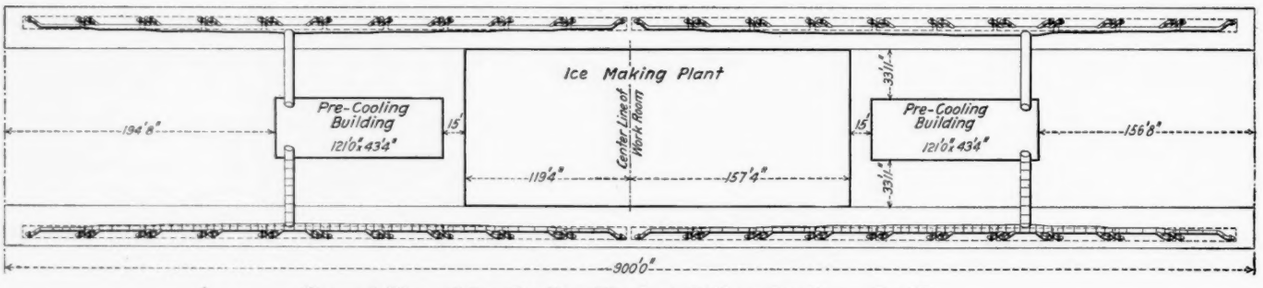
shown in the vertical section, a deflector is placed opposite the mouth of the pipe to throw the air current upward. The fruit is so packed as to leave an open space at the top of the car opposite the door, and in this space a special deflecting device is placed during cooling to direct the air currents among the boxes of fruit.

The temperature of the car is reduced to as low a point as possible without freezing the contents, this minimum depending on the particular fruit or vegetable in the car. Oranges, for example, will stand a temperature of 24 deg., while other fruits cannot safely be brought below 32 deg. A thermostatically regulated valve is placed in each inlet to close the same automatically at a predetermined temperature. This will not happen to all of the cars simultaneously, of course, and the attendants are thus enabled to remove the apparatus from the cars which have attained the desired temperature while the remainder are being brought to that point.



Details of False Doors.

It requires from three to four hours to cool a car to the desired point. It will be observed from the plan view that the 40 cars are arranged in four equal lots. Handling these separate lots in rotation permits practically continuous operation of the plant.



Ground Plan of Pre-Cooling Plant at Colton; Southern Pacific.

The pre-cooling buildings, which are 121 ft. x 43 ft. 4 in., are built of reinforced concrete, and the mechanical equipment is the best. This includes the exhaust fans, which are motor-driven, the flexible piping, and the brine coils around which the air is passed, and which are therefore enclosed in an air-tight chamber.

In the description of the process, reference was made to a false door through which the cold air is forced into the car. A drawing of this door is included in the illustrations. As

The system used by the Southern Pacific is the Sprague-Edson. The pre-cooling plant work is in charge of C. M Secrist, General Manager of the Pacific Fruit Express Co., the refrigerator car line of the Southern Pacific. A. Faget is Consulting Engineer on the pre-cooling plants. We are indebted to J. D. Isaacs, Consulting Engineer of the Harriman lines, for the foregoing information.

General News Section.

The Kansas State Board of Health has issued an order requiring that on and after September 1 next common drinking cups shall not be used in railway trains or stations or in public and private schools and state educational institutions.

David C. Barrow, Chancellor of the University of Georgia, has been chosen the third arbitrator to consider the settlement of the strike of firemen on the Georgia Railroad. The other arbitrators are Congressman Hardwick and Hon. Hilary A. Herbert, former Secretary of the Navy.

Train No. 97 of the Canadian Pacific was stopped by four masked robbers on the night of June 21 near Kamloops, B. C., but no valuables were taken. It is supposed that the robbers had intended to stop train No. 5. The robbers escaped by crossing a lake in a boat. They were pursued by a large number of men.

The Boston & Maine, which for many months has been considering a plan to pay pensions to employees, has secured the passage by the Massachusetts legislature of a law authorizing such action by the company; but, as we are informed by an officer of the road, no decision has been reached as to what is to be done or when action will be taken.

As a bit of summer reading we copied last week, from another paper, the statement that Mr. Harriman was going to make a park, pleasing to the eye, from Omaha to Oakland, by beautifying the right of way, the whole distance, with broad strips of green sward and with trees. The basis for the item, so far as it has a basis, is that in Nebraska the Union Pacific allows farmers to cultivate unused ground on the right of way, and that these farmers plant a good deal of alfalfa.

The downtown tunnels of the Hudson & Manhattan, which run from the Hudson Terminal buildings in New York under the Hudson river to the Pennsylvania station in Jersey City, are to be opened for operation on July 19. An elaborate celebration will be held at the Jersey City terminal. The entire tunnel system, which runs to the Erie and Lackawanna stations, as well as to the Pennsylvania station, will be completed and ready for operation on July 19, but inability to obtain sufficient cars from the builders will delay the opening of the Erie and Lackawanna tubes until August 2.

The University of Michigan has issued a bulletin (Volume X, No. 20), announcing the beginning at the commencement of the next term of a four-year course in railway administration. The Department of Political Economy, of which Professor Henry C. Adams is the head, will furnish the larger part of the instruction; but the literary department, the law department and the engineering department will co-operate. Students must be admitted to the literary department as candidates for a degree, or else must come into the graduate school under the usual conditions. E. D. Jones is secretary of the committee on business administration, which has charge of the new course.

On the Bessemer & Lake Erie for a number of years the flags carried on the rear of trains as markers have been yellow, a practice which, unlike that prescribed by the standard code, is consistent with the use of yellow for caution in fixed signals; but this consistent practice is now abandoned, and the inconsistent practice of using green flags has been adopted—this for the purpose of making the signals consistent with those of the Erie Railroad, on which the inconsistent practice of the standard code is in vogue. The Erie runs trains over a part of the Bessemer & Lake Erie. Green is also substituted for yellow in the sides and fronts of the marker lamps, and the change in both flags and lamps takes effect also on the front ends of engines.

The White Star steamship "Cedric," which left New York for Liverpool Saturday, June 12, landed its London passengers and mail on Sunday, the 20th, at Holyhead, and they reached London at 5.48 p.m., about the time that the steamship arrived at Liverpool. The vessel arrived at Holyhead at 11.23, landed the passengers by noon, and these were taken to London by three special trains. The White Star line has not been able to secure the accommodations at Liverpool necessary to despatch its westbound steamers at a satisfactory hour, and the Holyhead experiment will be tried with other vessels.

The Cunard steamship "Mauretania," which left New York on Wednesday, June 16, reached Liverpool at 10:15 on the night of Monday, the twenty-first, so that passengers who took the special train for London that night reached the metropolis in five days, eight hours, from New York. The time of the "Mauretania" from Sandy Hook to Daunt's Rock was 4 days, 17 hours, 21 minutes, 50 minutes better than the best previous eastward record, which was made by the "Mauretania" a couple of weeks ago. The run was 2,933 knots, or an average of 25.88 knots an hour.

A Free Advertisement for the Argentine Central.

[A. B. Hyde, of Denver, in New York *Evening Post*.]

Gray's Peak, Colorado, is 14,300 ft. high, with a horizon wider than any other on our planet, and at a height reached by no other railway, not even by the one crossing the Andes in Peru. From Denver one goes 50 miles up the Clear Creek Canyon (by the Colorado & Southern), grand in mountain scenery; but at Georgetown sublimity begins. We formerly here took saddle; now we have the Pullman of the Argentine Central. This marvel of engineering through chasms, over ridges, in and out toward every point of the compass, gives the fullest acquaintance with "awful" mountain scenery. It now leaves you in the great Waldorf mining property, but it will soon be complete to the summit, three miles onward and upward. * * * Here the sun truly and visibly *comes up*. It visibly *goes down*, and the stars seem at your finger tips! Here will soon be a hostelry, an observatory with telescope. From Denver at 8 a.m. and back at evening one sees the world's choicest of mountain scenery and by night the heavens declare the Endless Glory.

Negro Firemen.

In commenting on a recent editorial on negro firemen in the *Railroad Age Gazette* the *Railroad Herald* of Atlanta, Ga., says in part:

"We think the *Age Gazette* was more bent on criticism than a correct editorial analysis of the situation, and we might begin with the grave disclosure which the *Age Gazette* also made in the same paragraph, viz.: that the negro's ineligibility as an engineman is due to social reasons wholly. The correct view is, we think, that railways in the South have not committed themselves to any social policy in this matter. The social mingling is a question which the railways have not entered into, but as we now see from this strike, the question is very decidedly raised by the firemen's brotherhood.

"It seems to us that the position of southern roads in regard to using negro firemen is purely commercial, with a strong admixture of common humanity. The negro comes to the railway cheaper than the white firemen. Then, among business men universally in the South there is no disposition to expel him from industrial life just because he is a negro. So, he is given the work he is capable of doing, but not given that which it is thought best not to trust to the senegambian brain.

As to the negro fireman being a detriment to the material from which enginemen are drawn, the negro can't have much weight in this respect as long as he shall not be drawn. There

are some white firemen who, too, for reasons deeper than the epidermis, are not apt to be enginemen. Why not say that their employment as firemen cheapens the engineer of the future?

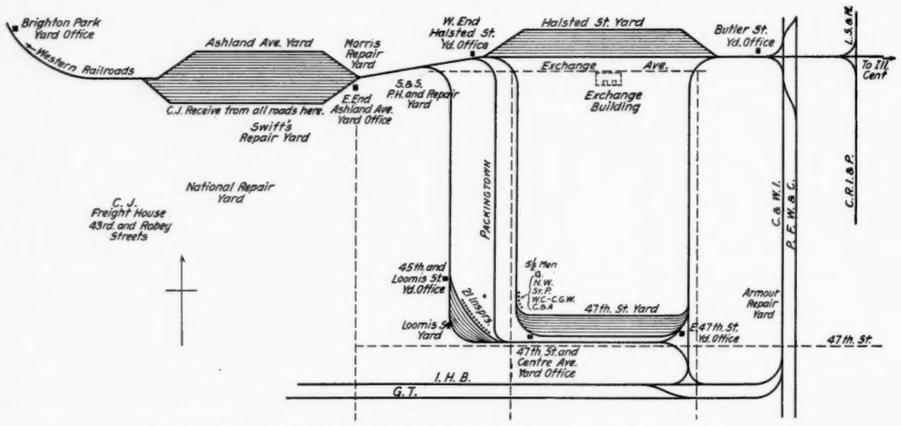
In the North all white firemen must be used, and some even with the social ban or the race barrier not upon them will yet not become enginemen. Certainly it is reasonable to say that a railway might count upon having in its employ an average of non-promotable firemen.

Joint Interchange and Inspection at Union Stock Yards, Chicago.

The committee of car service officers, which (as stated by the *Railroad Age Gazette* in its issue of January 15, 1909, page 132) was appointed a few months ago to investigate and report on the advisability of establishing a bureau or bureaus for joint interchange and inspection of cars at Chicago, has prepared a report favoring the establishment of such a bureau for dealing with cars inspected and interchanged at the Union Stock Yards. The report of the committee, of which J. M. Daly, Car Accountant of the Illinois Central is Chairman, was made to a committee of general superintendents, of which C. L. Ewing, General Superintendent of the Illinois Central is Chairman. The data on which it is based were collected by the Car Efficiency Committee. A committee of mechanical department officials, representing the Chicago Car Foremen's Association, after going into the question thoroughly, also recommended to Mr. Ewing's committee that a joint arrangement be made.

The conditions at the Union Stock Yards are perhaps unique, and the committee thought that this would be a favorable point at which to make the first trial of the proposed system in Chicago.

About 2,500 cars are interchanged daily at the Union Stock Yards between the Chicago Junction Railway on one side and nearly all the railways entering Chicago on the other, not including loaded stock cars in, and empty stock cars out, which are accounted for on a trackage basis and are not interchanged. The arrangements of the tracks of the various railways is illustrated by the accompanying drawing. The Chicago Junction Railway receives from all lines in its Ashland avenue yard. It delivers to seven western roads at its 47th street yard, and to all others—mostly eastern roads—at its Loomis street yard. The 47th street and the Loomis street yards are about a block apart, while the Ashland avenue yard is about a mile distant from these and is so situated that most of the trains of western roads pass through it in taking cars from the receiving tracks at 47th street and Loomis street to the yards of the railways themselves.



Chicago Stock Yards—Railway Track and Connections.

With few exceptions everything except live stock going to the Union Stock Yards district is delivered to the Chicago Junction, which in turn delivers the cars to the industries in that vicinity. Loads originating at the 160 industries in the territory and destined to points beyond its limits are hauled by the Chicago Junction from the loading tracks and placed on the receiving tracks of the several roads. The switching charge is paid and a reclaim is allowed to the Chicago Junction for each load that is brought in; and this is doubled when a car is reloaded out. The Chicago Junction employs 14 yard clerks, one or more being on duty both day and night at the leads of important yards. Separate clerks are employed by it to take records and to re-seal cars requiring seals.

In the case of cars moving from the Chicago Junction to the trunk lines the practice is for the various roads to notify the Chicago Junction when light repairs to cars are necessary before they can be moved. and the C. J. decides whether to repair them where they stand or to require their removal to its repair track, which is nearby. Light repairs required on cars belonging to the packers are brought to the attention of the owners, who, unless transfer of the contents is necessary, usually repair cars where they stand, for which purpose they keep a force of repairers near at hand.

The data gathered show that the inspectors of the roads other than the Chicago Junction are inspecting an average of 36½ cars a day each. This is about one-third of their capacity and the cost per car is about 6 1-5 cents. On the other hand, the inspectors of the Chicago Junction inspect each about 100 cars a day at a cost of about 2½ cents per car. The excessive expense to the trunk lines is not due to greater cost of labor or materials, but to independent inspection by each road regardless of the number of cars handled. Despite the fact that nearly two-thirds of the average capacity of the inspectors employed by the railways is not utilized, the large lines are liable at any time to receive more cars than can be inspected properly within the time available. As much of the freight received from the Chicago Junction is perishable and is hauled long distances in fast trains, the most thorough inspection is needed.

The investigation showed that the inspectors for the mechanical departments and the yard clerks of the various trunk lines, take the numbers of all cars received and keep a complete record of them. The yard clerks who are usually located in the same or an adjoining room, take exactly the same record, except that they omit defects and note seals. This well illustrates the amount of duplication of work.

It was ascertained that hardly two roads had the same system of compiling and disseminating information. The reports to car accountants were found to be more or less incomplete and inaccurate as to number, initials and dates. The reports to the mechanical departments were found to be more satisfactory. Three roads which inspect cars when delivered at Ashland avenue exchange records with the Chicago Junction. They thus incur the expense of inspection and yet settle on the Chicago Junction's records. With few exceptions the roads are dependent on the reports of the Chicago Junction for data regarding the hours of both deliveries and receipts of interchange at night, although this is the critical time under per diem rules.

The committee believes that a reduction might be immediately effected in the number of employees under a plan of joint interchange and inspection that would save the roads an aggregate of at least $1,000 a month, and it believes that additional economies could later be affected. What is more important, the work would be much better done.

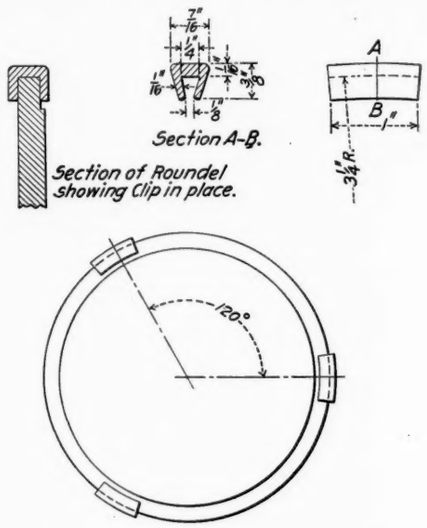
Some of the features of the bureau plan proposed are as follows: (1) All employees are to be employed by the manager. (2) All clerical work will be taken from inspectors and provided for in the bureau office, except that they will be required to keep their present book record, to which will be added a record of seals and of hours cars are received. (3) Inspectors' reports will be the basis for all per diem and record purposes. (4) A book record will be kept in the bureau office covering all cars interchanged which will answer for both the mechanical and the transportation departments. (5) Inspectors' records will be collected at frequent intervals.

day and night, and per diem reports will be ready for mailing at the close of each day. (6) Inspectors' reports to the bureau of the date and hour cars are placed on the tracks of one road by the engine of another will serve as a basis for per diem reports for both receiving and delivering roads, thus avoiding discrepancies and also furnishing data for defect cards. (7) The bureau will issue defect cards when due. This important work will be simplified and much clerical work, especially by the Chicago Junction, dispensed with because of the fact that records for all interchange within the district will be at one point.

It is believed that under the bureau plan, with close checking of available equipment, some arrangement can be made by the roads whereby the Chicago Junction will either switch the empties from one road to another or permit the roads themselves to do so to fill requisitons by the industries located in the district from empty cars already standing in the yards there.

Rubber Clip for Signal Light Roundels.

The accompanying engraving shows a device recently developed and adopted by the signal department of the Chicago, Rock Island & Pacific to obviate the use of putty for holding



signal roundels in place. It consists of a small rubber clip of dimensions as shown. Three of these are required for each roundel. They are easily and quickly applied and are a great convenience, especially in cold weather, when putty solidifies and fingers are numb.

New Subway Proposal in New York.

The Bradley-Gaffney-Steers Company has presented to the State Public Service Commission an offer to build with private capital the Broadway-Lexington avenue subway from the Battery to the Bronx, a two-track connecting subway in Canal street, the Lafayette avenue-Broadway route in Brooklyn and two spurs of the Broadway-Lexington avenue route along Jerome avenue and 138th street in the Bronx. The estimated cost of this work is $83,000,000. The company also offers to operate the bridge loop subways and the Fourth avenue (Brooklyn) subway if built by the city.

The company stipulates that the city complete the bridge loop subway and build with its own money the first section of the Fourth avenue subway to Ashland Place, Brooklyn, and eventually complete the Fourth avenue route to 40th street, as already planned.

The proposed routes are as follows:

Section A—Extending from the Battery, through Church and Vesey streets, with double tracks, to Broadway; thence, with a four-track double-deck system, northerly along Broadway to 10th street; thence through private property to Irving Place; thence northerly along Lexington avenue, under the Harlem river, to Mott avenue and its juncture with 149th street, following substantially the line, plans and specifications of the Broadway-Lexington avenue subway, as laid out by the Commission.

Section B—Two tracks in the existing subway known as the subway loop, now nearing completion, and thence across the Manhattan and Williamsburg bridges, with necessary connections, and a terminal in City Hall Park.

Section C—A two-track subway, connecting with Sections A and B, along Canal street.

Section D—Two tracks in a subway from the eastern terminal of the Manhattan bridge, along Flatbush avenue extension and Fulton street, to Ashland Place, in the borough of Brooklyn, this being a portion of the route laid out by the Commission, known as the Fourth avenue subway.

Section E—A two-track subway along Fulton street from Ashland Place to Lafayette avenue, thence easterly along Lafayette avenue to Reid avenue; thence northerly along Reid avenue to Broadway (Williamsburg); thence westerly along Broadway to the Williamsburg bridge.

Section F—A two-track subway or elevated railroad northerly along Jerome avenue, substantially as established by the Commission in its proposed Broadway-Lexington avenue route.

Section G—A two-track subway or elevated railroad easterly from Mott avenue, in the borough of the Bronx, along 138th street and northeasterly, substantially as established by the Commission in its proposed Broadway-Lexington avenue route.

Section H—The Fourth avenue subway, from the intersection of Ashland Place and Fulton street southerly, in the borough of Brooklyn, as laid out by the Commission.

Not only does the company offer to build with its own money; it also says it will take the city in as a partner and divide the profits after deducting operating expenses, maintenance charges, amortization payments, rentals, interest on cost of construction and equipment, etc.

Travis H. Whitney, secretary of the Public Service Commission, is quoted as authority for the statement that the B.-G.-S. Company has good financial backing, and Chairman Willcox of the Commission is quoted as saying that the plans for the proposed routes are practically all complete, in every instance the consents of owners have been obtained. The Commission will draw up a form of contract and send the offer promptly to the Board of Estimate and Apportionment for concurrence.

Railway Development in Asia.

More attention has been given to the advance of railroads in Asia Minor than to their development in Greater Asia. Now that Russian enterprise and the momentous issues that were bound up with the building of the Trans-Siberian have retired into the background, no more significant contribution is being made to the world's progress than the railways which are being planned or constructed in the southern part of the continent. Obviously, had commercial considerations dominated the construction of a trans-Asiatic road, the southern route would necessarily have been preferred. Here there is trade and population, and the distance of two thousand miles across the Indian peninsula is already traversed by railway. In Central Asia the Russian railway builder was at work more than a quarter of a century ago. It took Russia ten years to subdue the wild Turcoman tribes of Trans-Caspia, but that done, the work of connecting the Caspian by railway with Mrv, Kokara and Samarcand was promptly undertaken. The first 700 miles of this railway were laid across a howling wilderness on which were but four small oases. It was begun in 1880; was completed to Samarcand and was paying its expenses by 1890. Since then trade and traffic have developed rapidly, and communication with Russia proper has been so far perfected that a traveler from Moscow may reach the Afghan frontier within 60 miles of Herat in five days. Ashkabad, the capital of Trans-Caspia, and an important railway center for the Russian lines, is only 160 miles northwest of Meshed, the capital of the Persian province of Khorassan. Here it seemed as if railway building in that direction were to be permanently barred. Some twenty years ago, when Russia beat England in the struggle for influence at Teheran, the Russian Minister demanded and received from the Shah

the sweeping concession against progress that no railway should be allowed in Persia. As Mr. Truxton Beale, formerly American Minister at Teheran, put the case: "Persia was to lie fallow, free from foreign entanglements, until Russia saw fit to make use of her."

But now that an agreement has been reached between Russia and Great Britain in regard to their respective spheres of influence in Persia, the veto on railway construction has been lifted. As the British sphere is in Southern Persia, the way is at length opened for the construction of an all British railway across Southern Asia to the frontier of China. Some recent developments on the other side of Asia will probably tend to hasten this consummation. A treaty between Great Britain and Siam was signed on the 10th of March, under whose provisions the Federated Malay States, which are under British sovereignty, agree to advance to Siam, on easy terms, $20,000,000 for the purpose of constructing a railway from Bangkok southward to the Malaysian boundary. This line when completed will furnish a through service between Bangkok and Singapore, instead of the tedious sea journey, which is at present the only means of communication. The treaty also provides for a renunciation of the suzerainty exercised by Siam over three states adjoining her northeastern territory in favor of Great Britain, and there is thus established a continuous stretch of British posessions from Singapore to the Persian Gulf. The bearing of this fact on the possibility of an all British South Asiatic railway is sufficiently apparent. The first link of such a system must obviously pass through Arabia, but once it has emerged on the Persian Gulf it only needs the intervening space up to the Indian frontier to be bridged to complete a continuous line to the borders of China, from which a branch will naturally connect with Singapore. France is working up to the Chinese border from Hanoi and Saigon. There is already designated on the French maps a completed railway from Hanoi to Lao-Kai, on the border of the Chinese province of Yunnan, while a line under course of construction is marked running from Lo-Kai to Yunnan-Fu, the capital of the province into which the French railway concession extends. The Government of French Indo-China has been authorized to raise a loan of $10,317,000 in order to meet the expenditure charged to the budget of that dependency in connection with the construction of the Yunnan Railway.—*Journal of Commerce, New York.*

Wholesale Prices in 1908.

The annual report on wholesale prices, published by the bureau of labor, shows that the average price of 258 representative staples for 1908 was 5.2 per cent. below that for 1907—the year of highest prices during a 19-year period. It exceeded the average for every other year of the period, but was only 0.2 per cent. higher than the average for 1906. As compared with 1897, the year of lowest prices during the period, the advance in 1908 was 36.9 per cent., and as compared with the average for the ten years, 1890 to 1899, the advance was 22.8 per cent.

The decline from the prices shown by the October, 1907, data continued without interruption until August, 1908, with the exception of a slight advance in July. Prices were at their lowest point of the year 1908 during the month of August, when they were 1.1 per cent. below the average for that year and 7.3 per cent. below the average for October, 1907, the highest point in the 19 years covered. The prices in December, 1908, show an advance of 1.8 per cent. over the prices in August.

Of the 258 articles for which wholesale prices were obtained, 162 showed a decrease in the average price for 1908 as compared with 1907, 33 showed no change and 63 showed an increase. In farm products there was a decrease in price of 2.9 per cent. in 1908 below the average for 1907, this decrease being the least of any of the seven groups showing a decrease; food increased 2.4 per cent. in price; cloths and clothing decreased 7.7 per cent.; fuel and lighting decreased 3.1 per cent.; metals and implements decreased 12.6 per cent.; lumber and building materials decreased 9.4 per cent.; drugs and chemicals increased 0.7 per cent.; house furnishing goods decreased 3.8 per cent., and the miscellaneous group decreased 5.7 per cent.

The Canadian Pacific Safety League.

The Canadian Pacific Safety League is the name of an organization of employees of the road named, which has been formed at West Toronto; and at one of its first meetings, a "smoking concert" which was held on May 21, about 300 employees were present. General Superintendent James Oborne and other officers were present, and Mr. Oborne made a felicitious speech. The members are said to have smoked the pipe of peace—though we do not learn that there had been any enmities which needed to be settled—and, as we are informed by a member, there was a splendid program of music and elocution.

The association was started a few months ago at the instance of a few members, of whom S. Jackson was the leader. It is proposed to have frequent meetings for the discussion of good railway practice, and the answering of knotty questions concerning the rules. The members are determined to stick to correct principles in their discussions, and to keep in close touch with the officers, so that all decisions shall be confirmed authoritatively. At the ordinary meetings it is intended that the proceedings shall be kept sufficiently private to encourage all members to speak freely, even if they have complaints to make; and measures will be taken to insure impartial treatment of all matters. It is understood that officers of the company are not to be present, except when invited. In short, this seems to be a scheme to dignify and make useful that ancient American institution the "round house committee." Thirteen meetings for discussion have been held already and the members believe that from them they have received much benefit.

A League has also been formed at Havelock.

The Business of the Express Companies.

During the first five months of the year the four leading express companies have transacted business which shows an advance of from 10 per cent., in the case of one company, to 20 per cent. in the case of some of the others, as compared with the operations of a year ago. The condition of the express companies is one of the best guides to the general conditions of the country. An improvement in commerce and trade is instantly reflected in the returns of the express business, and as a general rule the periods of depression are quickly felt. The most notable exception to this was the crisis of 1907-8, when the express companies were comparatively little affected by the panic conditions and dividends were not diminished.

The present increase in activity, which on the average may be estimated at about 17 per cent., is a fairly accurate barometer of trade and commerce. It is stated by officials of the principal companies that the progress is felt in every department of the express business, not only in the carrying branch but in the money orders, travelers' checks, etc., as well.

The value of express companies' stocks as dividend payers in the past five years is shown in the following table:

	Per cent.				
	1908.	1907.	1906.	1905.	1904.
Adams Express Co....	8	*10	10	10	10
American Express Co.	12	12	9½	8	8
United States Exp. Co.	4	5	4	4	4
Wells, Fargo & Co....	10	10	9	8	8

*Also $200 in bonds.

The fluctuation of market quotations for express stocks is shown in the following table, which gives the lowest point touched during the recent crisis and the highest reached in the present advance:

	Highest.	Lowest.
Adams Express Co.....	199¾	150
American Express Co.....	230	175
United States Express Co.....	99	70
Wells, Fargo Co.....	330	250

A curious fact which throws a light upon public opinion of this class of business enterprise is that while the panic fears of 1907-8 were throwing banks and trust companies into confusion, a great many persons, especially in the West, entrusted their savings to the express companies, in the belief that they would be safer there than elsewhere.

The four leading companies are devoting a great deal of

attention to expansion of connections, and the result of all this is considerably greater gross earnings. As an example of this fact it may be mentioned that the United States Co. has recently introduced a through car service between St. Louis and New York, and this is reported to have led to an increase of at least 20 per cent. in the company's business over that section.—*Wall Street Journal.*

A 5,000-Ton Revenue Train Load.

On Monday, June 14, a freight train of the Pennsylvania Railroad loaded with 4,451 tons of coal was run from Altoona, Pa., eastward to Enola (near Harrisburg), 124 miles, in 7 hours, 15 minutes, or at an average speed of 17 miles an hour. One stop was made for water. The train consisted of engine No. 1113, weighing 241,000 lbs.; 85 steel gondola cars and a caboose. The total weight of the train was 6,151 tons, and its length from the pilot of the locomotive to the rear platform of the caboose was 3,000 feet, or about three-fifths of a mile. The company had made a number of road tests previously, but this performance surpassed all others. The other runs were:

Date.	Engine.	No. of cars.	Total weight of train.	Time.
June 8	No. 3212	75 steel.	5,307 tons.	10 hrs. 21 min.
" 8	" 2903	75 "	5,348 "	8 " 2 "
" 8	" 451	75 "	5,348 "	10 " 12 "
" 3	" 3212	85 mixed.	4,852 "	12 " 30 "
" 5	" 1641	86 "	4,922 "	9 " 42 "
" 8	" 2905	87 "	4,623 "	10 " 21 "

These runs were made possible by the fact that the company has now reduced all grades and compensated all curves on the Middle division, so that the ruling grade eastward is only .2 per cent., or less than 12 ft. to the mile. The last step in this scheme of improvements was taken lately in the opening to service of the four tracks between Mt. Union and Ryde, 11 miles. Formerly it was necessary to have a pusher over some of the grades. Now a single locomotive unaided accomplishes these record results.

Engine 1113 is class H8b, four pairs of driving wheels and a leading two-wheel truck; diameter of driving wheels, 62 in.; cylinders, 24 in. x 28 in.; steam pressure, 205 lbs. per square inch; heating surface, 3,839 sq. ft.; grate area, 55.12 sq. ft.; tractive power, 42,661 lbs.

On June 18 the same engine took a longer train, 94 cars, over the same course in 7 hours, 31 minutes. The lading of this train weighed 5,042 tons, and the total weight of the train was 6,922 tons. Thus nearly 73 per cent. of the load was revenue tonnage.

Commissioner Lane on Reparation.

Franklin K. Lane, of the Interstate Commerce Commission, in an interview says that the matter of reparation to shippers has not been carefully thought out in the law as it stands. Mr. Lane says in part:

"When we come to amend the law, we ought to abolish all reparation except when the shipper has protested in writing against the rate he has paid. The existing rate is regarded by the law as the lawful rate, and it may not be attacked before a court, but may be attacked before the commission at any time.

"Under the present commerce law we have the power and we have been in the habit of awarding damages to a complainant when an unreasonable rate has been charged down to the basis of what we regard as reasonable, so that a complainant may bring in a claim to-day under a rate that was charged eighteen months ago, and if the commission finds that the rate was unreasonable it may award damages to the shipper, although he may have given no notice to the railway that he thought the rate was unreasonable when it was charged.

"A shipper of machinery from Cleveland to Denver recently made a shipment of a carload of machinery, and other shippers also make shipments of machinery from Cleveland to Denver. One year from now one of the shippers attacks the rate charged him as unreasonable and asks reparation. The commission finds the rate to have been excessive and awards damages in a sum represented by the difference between the excessive rate and a reasonable rate. The other shippers, however, fail to make application, so the railways's books show that one shipper at the end of the two-year period has received a lower rate than other shippers. Such a rate limits or contracts commerce; it gives direction to commerce; it holds back the development of enterprises at one locality and helps them at other places, so that no one can tell the amount of damage that has been caused shippers who do not protest, and no one can estimate to what extent a city or a district loses on account of unreasonable rates, and an award of damages based on the difference between a reasonable rate ordered by the commission and an unreasonable rate imposed by the railways in no way measures the real damages which those shippers or that city or district may have suffered, because their damages are based on the few carloads that moved and not on the many carloads which might have moved if the almost prohibitive rate had not been in effect.

"It seems to me that when the time comes to amend the Interstate Commerce Act it would be reasonable to give consideration to this proposition: That reparation shall be awarded only after protest is made at the time of shipment against the legality of an existing rate."

A Turntable for the Monsters.

At Auburn, California, the Southern Pacific has just put in a turntable for the new "class 4000" locomotives. The pit is more than 100 ft. in diameter. The table proper is 98 ft. long. The truss was carried across the continent on two specially built cars. It looks like a bridge already set up.

Cape Cod Ship Canal.

Work has been begun on this canal, the first shovelful of earth having been turned at Sandwich, Mass., last Tuesday by August Belmont. Work has already been begun on breakwaters at the southern end of the proposed canal.

Nine Passengers Killed on Electric Car in Indiana.

In a butting collision of electric cars on the Chicago, Lake Shore & South Bend at Baileytown, Ind., on the night of June 19, ten persons were killed and about forty injured, the killed including the motorman of the eastbound car. This car, according to the reports, was encroaching on the rights of the westbound car. The westbound car had been brought to a stop before the collision occurred, the motorman having seen the headlight of the other, the line being straight. The eastbound motorman, however, appears to have done nothing to slacken the speed of his car, which was running at 50 miles an hour when it struck the other. The eastbound car had been ordered to wait for the westbound at Wilson, but did not do so. It was impossible to send relief to the injured persons by electric cars because the power wire had been broken, and physicians and nurses were sent from South Bend and Laporte, on the east, and from Whiting and Indiana Harbor, on the west, by express trains of the Lake Shore & Michigan Southern, and these trains also took the injured passengers to hospitals at South Bend and Laporte.

Cape to Cairo.

Two more steps have recently been taken toward the realization of the late Cecil Rhodes' "substantial dream" of a Cape to Cairo railway. It is announced that this month Messrs. Pauling & Co. will start work on the construction of a 400-mile extension northward from Broken Hill. At the other end of the "gap" is Halfaya, 1,340 miles south of Cairo and only separated from Khartum by the Blue Nile, across which a new railway and road bridge is now in course of construction by the Soudan government. As soon as the Soudan government railway administration is able to utilize this temporary bridge for the passage of its freight trains it intends to make a start with the southward extensions of its system at Seunar, a city of the Eastern Soudan on the Blue Nile, 160 miles

southeast of Khartum. From Seunar it is also intended to construct a branch line in a westerly direction, doubling back at almost a right angle to El Obeid, the capital of Kordofan. This railway will cross the White Nile near the village of Goz Albu Guma, about 192 miles south of Khartum, and the contract for the construction of the road and rail bridge at this point has been awarded to the same firm which built the viaduct over the Zambesi at Victoria Falls, the Cleveland Bridge & Engineering Co., Darlington, Eng.—*South African Commerce and Manufacturers' Record.*

Freight Traffic Agents' Association.

The fourth annual convention of the National Association of Freight Traffic Agents was held at Niagara Falls June 22, with 100 agents present. William Hodgdon, Freight Traffic Manager of the Pennsylvania Lines West, delivered an address.

MEETINGS AND CONVENTIONS.

The following list gives names of secretaries, dates of next or regular meetings, and places of meeting.

Air Brake Association.—F. M. Nellis, 53 State St., Boston, Mass.
American Association of Demurrage Officers.—A. G. Thomason, Scranton, Pa.
American Assoc. of Local Freight Agents' Ass'ns.—G. W. Dennison, Penna. Co., Toledo, O.
American Institute of Electrical Engineers.—R. W. Pope, 33 West 39th St., New York; second Friday in month; New York.
American Railway Association.—W. F. Allen, 24 Park Place, New York.
American Railway Bridge and Building Association.—S. F. Patterson, B. & M., Concord, N. H.; Oct. 19, 1909; Jacksonville, Fla.
American Railway Engineering and Maint. of Way Assoc.—E. H. Fritch, Monadnock Bldg., Chicago.
American Railway Industrial Association.—R. E. Wilson, Ry. Exchange, Chicago.
American Railway Master Mechanics' Association.—J. W. Taylor, Old Colony Bldg., Chicago.
American Society for Testing Materials.—Prof. Edgar Marburg, Univ. of Pa., Philadelphia; June 29-July 3; Atlantic City.
American Society of Civil Engineers.—C. W. Hunt, 220 W. 57th St.; N. Y.; 1st and 3d Wed., except July and August; New York.
American Society of Mechanical Engineers.—Calvin W. Rice, 29 W. 39th St., N. Y.; 2d Tues. in month; annual, Dec. 7-10; New York.
American Street and Interurban Railway Association.—B. V. Swenson, 29 W. 39th St., New York; Oct. 18-22; Denver, Colo.
Association of American Railway Accounting Officers.—C. G. Phillips, 143 Dearborn St., Chicago; June, 1910; Colorado Sp'gs.
Association of Railway Claim Agents.—E. H. Hemus, A., T. & S. F., Topeka, Kan.
Association of Railway Telegraph Superintendents.—P. W. Drew, Wisconsin Central Ry., Chicago.
Association of Transportation and Car Accounting Officers.—G. P. Conard, 24 Park Pl., New York.
Canadian Railway Club.—James Powell, Grand Trunk Ry., Montreal, Que.; 1st Tues. in month, except June, July and Aug.; Montreal.
Canadian Society of Civil Engineers.—Clement H. McLeod, Montreal, Que.; irregular, usually weekly; Montreal.
Central Railway Club.—H. D. Vought, 95 Liberty St., New York; 2d Friday in January, March, May, Sept. and Nov.; Buffalo.
Freight Claim Association.—Warren P. Taylor, Rich., Fred. & Pot. R. R., Richmond, Va.
International Master Boiler Makers' Association.—Harry D. Vought, 95 Liberty St., New York.
International Railway Fuel Association.—D. B. Sebastian, La Salle St. Station, Chicago.
International Railway General Foremen's Association.—E. C. Cook, Royal Insurance Bldg., Chicago.
Iowa Railway Club.—W. B. Harrison, Union Station, Des Moines, Ia.; 2d Friday in month, except July and August; Des Moines.
Master Car Builders' Association.—J. W. Taylor, Old Colony Bldg., Chicago.
New England Railroad Club.—G. H. Frazier, 10 Oliver St., Boston, Mass.; 2d Tues. in month, ex. June, July, Aug. and Sept.; Boston.
New York Railroad Club.—H. D. Vought, 95 Liberty St., New York; 3d Friday in month, except June, July and August; New York.
North-West Railway Club.—T. W. Flannagan, Soo Line, Minn.; 1st Tues. after 2d Mon., ex. June, July, August; St. Paul and Minn.
Railway Club of Pittsburgh.—J. D. Conway, Pittsburgh, Pa.; 4th Friday in month, except June, July and August; Pittsburgh.
Railway Signal Association.—C. C. Rosenberg, 12 North Linden St., Bethlehem, Pa.
Railway Storekeepers' Association.—J. P. Murphy, Box C., Collinwood, Ohio.
Roadmasters' and Maintenance of Way Association.—Walter E. Emery, P. & P. U. Ry., Peoria, Ill.; Nov., 1909; Washington.
St. Louis Railway Club.—B. W. Frauenthal, Union Station, St. Louis, Mo.; 2d Friday in month, except June, July and Aug.; St. Louis.
Society of Railway Financial Officers.—C. Norquist, Chicago; Sept. 7-8; Fort William Henry, Lake George, N. Y.
Southern Association of Car Service Officers.—J. H. O'Donnell Bogalusa, La.
Southern and Southwestern Ry. Club.—A. J. Merrill, Prudential Bldg., Atlanta; 3d Thurs., Jan., April, Aug. and Nov.; Atlanta.
Traveling Engineers' Association.—W. O. Thompson, N. Y. C. & H. R. R.R., East Buffalo, N. Y.; September, 1909; Denver.
Western Canada Railway Club.—W. H. Rosevear, 199 Chestnut St.; Winnipeg; 2d Mon., ex. June, July and Aug.; Winnipeg.
Western Railway Club.—J. W. Taylor, Old Colony Bldg., Chicago; 3d Tuesday each month, except June, July and August; Chicago.
Western Society of Engineers.—J. H. Warder, Monadnock Bldg., Chicago, 1st Wednesday, except July and August; Chicago.

Traffic News.

W. J. Gibson was arrested in Chicago, June 21, on a charge of obtaining illegal concessions in rates from the Illinois Central on shipments of fertilizer.

The "Memphis Special" of the Southern Railway, leaving New York over the Pennsylvania at 9.25 p.m., now arrives in Memphis at 7.30 on the second morning, which shortens the former schedule about seven hours.

After a trial of about three weeks, the reduced rate summer tourist fares from Chicago to New York and the sea coast resorts have proved so popular that the roads have decided to continue them throughout the summer.

At Charleston, W. Va., June 22, James Burdett, in the Circuit Court, granted an injunction restraining Attorney-General Conley and the various county prosecutors from enforcing the 2-cent fare act of West Virginia against the Chesapeake & Ohio.

The Chicago, Milwaukee & St. Paul intends to issue its transcontinental freight tariffs independently of the Transcontinental Traffic Association. It is desired to keep this business in such a condition that changes in rates can be made promptly when it is desirable to do so.

Trolley competition has forced the Chicago, Peoria & St. Louis to make a rate of 90 cents for one-way passenger tickets between Peoria and Springfield, or $1.30 for the round trip. The distance is 80 miles. The Chicago & Alton has met the cut, and it is expected that other roads will follow.

The last announcement from the Trunk Line Association committee in connection with westbound freight rates on imported goods is to the effect that on August 1 further reductions will be made from New York and other southern ports to meet the rates which have been made from Boston by the Boston & Maine.

The Grand Trunk Pacific is now running regular daily passenger trains between Winnipeg, Man., and Scott, Sask., 569 miles west of Winnipeg. Hitherto only a "daylight mixed" service has been maintained. According to the *Official Guide* for June, page 71, this daylight service extends to Wainwright, about 100 miles beyond Scott.

The "Shasta Limited" has been put in service over the Southern Pacific between San Francisco, Cal., and Portland, Ore., 772 miles. The train leaves San Francisco at 6 p.m. and arrives at Portland the following day at 9 p.m.; and southbound the time is about the same. Hitherto the fastest through train between these cities has been much slower, taking two nights on the road.

The New York Central announces that on the westbound Lake Shore Limited and Twentieth Century Limited express trains, on which berths are not sold to points east of Buffalo, passengers desiring to take a friend along with them as far as Syracuse can do so if there is room for him in the space which the passenger has paid for, the Syracuse passenger paying the regular fare and the excess fare as follows: Train 19, New York to Albany, $1, to Syracuse, $2; train 25 to Syracuse, $4.

The Lake Shore & Michigan Southern, in connection with the Pittsburgh & Lake Erie, announces a train between Buffalo and Pittsburgh to run through in 5 hours 15 minutes, which is three hours less than the best time now made. This change is the result of the competition between these lines and the other two through routes between these cities—the Buffalo, Rochester & Pittsburgh and the Pennsylvania. The distances between the cities by the different lines are: Buffalo, Rochester & Pittsburgh, 288 miles; Pennsylvania, 271 miles; New York Central Lines, 257 miles.

The Traffic Club of New York.

This club will have an outing and clam bake at Witzel's Point View Island, College Point, L. I., on Saturday, July 24. There will be the usual games, including a ball game between the industrial and the railway and steamship traffic men.

REVENUES AND EXPENSES OF RAILWAYS.

MONTH OF APRIL, 1909.
(See also issues of June 4, 11, and 18.)

Name of road.	Mileage operated at end of period.	Operating revenues			Operating expenses						Net operating revenues (or deficit).	Outside operations. net.	Taxes.	Operating income (or loss).	Increase (or dec.) comp. with last year.
		Freight.	Passenger.	Total, inc. misc.	Maintenance Way and structures.	Maintenance Of equipment.	Traffic.	Transportation.	General.	Total.					
Central Branch	388	$92,390	$23,161	$125,436	$27,097	$26,708	$3,657	$51,357	$3,878	$112,697	$12,739	.....	$9,500	$3,239	‡$37,065
Central New England	294	204,164	24,538	242,660	29,064	18,739	1,995	72,280	3,660	125,738	116,922	.....	5,600	111,322	33,662
Charleston & Western Carolina	340	91,750	20,363	119,045	26,547	8,340	2,607	43,724	4,791	86,209	32,836	.....	4,100	28,736	27,969
Chicago Great Western	818	400,532	144,624	592,526	115,102	142,916	36,051	284,188	32,307	610,564	18,038*	$1,075*	18,029	37,142†	‡90,878
Chicago, Indiana & Southern	329	214,862	16,290	237,428	39,629	46,915	8,445	101,628	7,733	204,350	33,078	508	12,500	21,086	9,399
Chicago, Peoria & St. Louis	255	86,719	21,666	114,912	16,799	26,755	6,331	56,458	4,655	110,998	3,914	.....	3,650	264	6,543
Colorado Midland	338	121,016	25,156	167,835	28,533	35,132	9,944	78,212	5,904	157,726	10,109	456*	7,650	2,003	‡16,138
Detroit & Mackinac	348	70,512	21,765	97,797	13,775	14,770	1,944	28,953	2,696	62,138	35,660	456*	6,850	28,354	‡084
Duluth, Missabe & Northern	282	175,101	34,600	214,682	49,054	76,352	1,744	63,388	14,772	205,310	9,372	5,081*	9,300	5,009†	44,936
Evansville & Terre Haute	310	103,569	44,856	165,443	16,681	14,735	3,977	51,945	6,040	93,378	72,065	274*	9,613	62,178	6,017
Georgia Southern & Florida	395	96,173	47,330	167,631	13,734	26,831	5,216	71,876	8,262	125,919	41,712	1,634	8,058	35,288	44,007
International & Great Northern	1,159	471,656	130,965	653,759	142,559	107,779	20,473	294,395	20,965	586,171	67,588	.....	17,000	50,588	74,782
International Ry. of Maine	233	75,109	33,870	115,312	14,295	17,648	4,329	50,663	2,762	89,697	25,615	.....	5,000	20,615	‡10,672
Iowa Central	558	199,115	34,800	245,695	42,468	57,284	9,205	104,835	8,488	222,280	23,415	.....	7,579	15,836	‡17,297
Louisiana Ry. & Navigation	341	84,228	12,027	102,078	21,109	14,951	3,770	38,456	5,576	83,862	18,216	.....	3,750	14,466	‡5,637
Mason City & Fort Dodge	386	108,134	32,377	149,280	22,480	24,034	1,591	60,226	594	108,925	40,355	949	8,937	32,367	‡3,370
Midland Valley	324	67,884	21,115	94,402	16,714	18,490	1,778	28,996	4,467	70,445	23,957	.....	8,000	15,957	‡700
Minneapolis & St. Louis	1,027	205,530	74,234	302,347	70,495	53,261	10,556	123,588	11,825	269,725	32,622	2*	16,356	16,265	13,045
Missouri, Kansas & Texas	3,072	1,338,598	516,914	2,001,752	237,077	226,161	50,726	809,753	76,402	1,400,119	601,633	1,557*	45,203	554,873	315,306
Missouri Pacific	3,492	1,220,250	301,094	1,703,269	355,891	324,789	48,703	727,165	57,548	1,514,096	189,173	1,701*	68,305	119,167	‡287,813
Mobile, Jackson & Kansas City	403	88,786	24,049	122,829	17,787	10,540	1,832	37,719	9,189	77,067	45,762	.....	3,346	42,416	24,773
Nevada & California	422	74,357	25,208	107,088	12,129	12,375	707	33,184	1,856	60,251	46,837	179*	6,200	40,458	55,770
Northwestern Pacific	373	78,986	125,161	222,430	46,437	41,822	2,949	81,345	9,202	181,755	40,675	.....	8,955	31,720	4,336
Pittsburgh & Lake Erie	191	788,416	92,651	912,856	114,069	168,818	13,011	216,964	19,669	532,531	380,325	403*	17,000	362,921	189,526
Quincy, Omaha & Kansas City	262	46,666	15,016	66,311	21,840	11,803	1,347	31,497	3,021	69,508	3,197*	.....	2,450	5,647†	‡1,964
St. Joseph & Grand Island	319	74,044	27,090	110,194	37,210	14,048	5,593	46,200	3,656	106,707	3,487	552	5,142	1,103†	‡42,804
St. Louis, Brownsville & Mexico	454	95,823	40,158	142,486	19,308	11,039	3,716	47,499	6,019	87,581	54,905	5	4,000	50,900	22,749
St. Louis, Iron Mountain & Southern	2,608	1,311,430	378,338	1,859,370	272,882	311,155	49,531	610,989	65,921	1,310,478	548,892	2,448*	54,150	492,294	88,853
Southern Indiana	236	91,257	12,449	106,151	10,735	10,282	1,546	26,790	6,348	55,701	50,450	.....	6,929	43,521	37,392
Texas & New Orleans	450	169,168	74,184	261,282	53,258	39,377	5,839	112,543	7,845	218,862	42,420	1,855	11,600	32,675	11,923
Texas Central	268	51,334	26,996	84,949	27,200	18,255	1,858	30,538	5,060	82,911	2,038	.....	4,195	2,157†	27,876
Trinity & Brazos Valley	455	100,619	11,515	115,299	38,700	28,438	4,100	63,756	12,251	147,245	31,946*	.....	3,000	34,946†	4,088
West Jersey & Seashore	356	127,064	259,419	412,130	75,754	49,949	10,190	160,807	8,336	305,036	107,094	1,731	26,680	82,145	12,911
Western Maryland	543	293,513	56,922	471,390	63,316	66,974	7,093	152,761	13,363	303,507	167,883	.....	16,500	151,383	‡8,971
Wheeling & Lake Erie	442	363,089	37,635	426,716	40,967	116,974	7,705	162,539	15,634	343,819	82,897	6,515	21,267	68,145	74,142
Wisconsin, Minn. & Pacific	271	32,117	13,741	50,347	13,333	7,965	278	21,693	312	43,581	6,766	.....	3,443	3,323	‡1,594
TEN MONTHS OF FISCAL YEAR.															
Central Branch	388	$1,063,850	$278,101	$1,443,288	$229,612	$198,919	$33,478	$508,451	$38,371	$1,008,831	$434,457	.....	$95,000	$339,457	‡$5,943
Central New England	294	1,699,063	273,047	2,093,939	313,026	204,458	18,653	712,496	29,917	1,278,550	815,389	.....	56,000	759,389	425,219
Charleston & Western Carolina	340	909,370	222,608	1,204,056	233,619	141,991	24,835	435,806	36,417	871,768	332,288	.....	41,000	291,288	71,565
Chicago Great Western	818	4,764,617	1,572,909	6,859,312	928,401	1,376,505	364,117	3,077,457	320,374	6,066,854	792,458	$5,538*	185,247	601,673	‡366,534
Chicago, Indiana & Southern	329	2,089,161	198,483	2,363,470	268,171	462,004	77,177	931,591	69,316	1,808,259	555,211	13,321	137,542	430,990	79,539
Chicago, Peoria & St. Louis	255	998,828	268,411	1,331,517	184,622	300,404	61,206	572,923	47,479	1,166,634	164,883	.....	44,000	120,883	39,118
Colorado Midland	338	1,370,570	303,270	1,929,648	248,679	281,431	98,578	823,198	59,053	1,510,939	418,709	3,803*	75,549	339,357	‡6,357
Detroit & Mackinac	348	666,283	238,585	959,651	148,771	152,503	18,144	314,649	27,020	661,087	298,564	3,181*	71,645	223,738	‡18,446
Duluth, Missabe & Northern	282	6,848,562	303,579	7,199,056	674,220	733,601	13,551	1,037,354	125,578	2,584,504	4,614,552	26,472	293,910	4,347,114	‡505,629
Evansville & Terre Haute	310	1,110,066	491,264	1,780,423	229,660	232,550	37,185	561,652	62,813	1,123,860	656,563	3,044*	91,916	561,603	‡10,835
Georgia Southern & Florida	395	960,488	508,284	1,669,473	148,389	276,865	51,304	628,630	84,994	1,190,182	479,291	14,928	82,551	411,668	191,984
International & Great Northern	1,159	5,039,785	1,430,734	6,914,953	1,194,801	1,086,994	163,954	2,803,959	206,015	5,455,723	1,459,230	.....	191,000	1,268,230	1,038,877
International Ry. of Maine	233	620,308	215,481	904,379	152,723	175,486	39,754	424,071	29,291	821,325	83,054	.....	50,000	33,054	‡35,740
Iowa Central	558	1,997,589	426,065	2,544,530	248,112	483,800	88,628	1,124,738	86,658	2,031,936	512,594	.....	73,982	438,612	‡305,440
Louisiana Ry. & Navigation	341	758,050	110,274	930,895	240,163	126,304	34,045	399,071	53,338	852,921	77,974	.....	34,500	43,474	66,552
Mason City & Fort Dodge	386	1,147,973	362,017	1,605,282	181,429	249,050	16,965	682,615	6,984	1,137,043	468,239	6,563	71,746	403,056	‡63,006
Midland Valley	324	548,564	219,946	816,639	190,354	183,210	17,691	272,761	44,371	708,387	108,252	.....	76,083	32,169	‡149,421
Minneapolis & St. Louis	1,027	2,369,814	892,924	3,512,650	346,688	479,062	100,772	1,300,211	120,846	2,347,579	1,165,071	301*	158,236	1,006,534	69,034
Missouri, Kansas & Texas	3,072	14,531,353	5,860,682	21,619,520	2,901,187	3,063,129	486,323	7,994,512	693,078	15,138,229	6,481,291	8,732*	921,968	5,550,591	‡243,654
Missouri Pacific	3,492	12,954,929	3,307,261	18,018,269	2,655,257	2,801,584	474,241	7,524,105	590,207	14,045,394	3,972,875	14,311*	762,250	3,196,314	‡213,734
Mobile, Jackson & Kansas City	403	960,440	256,990	1,303,592	204,393	150,952	16,820	406,106	89,992	868,263	435,329	.....	33,911	401,418	195,967
Nevada & California	422	624,393	217,935	916,807	115,290	114,837	7,788	346,365	19,421	603,701	313,106	3,831*	64,667	244,608	‡273,267
Northwestern Pacific	373	958,612	1,284,161	2,442,243	507,007	366,716	23,016	885,620	93,212	1,875,571	566,672	.....	90,650	476,022	73,818
Pittsburgh & Lake Erie	191	8,409,670	992,181	9,708,954	1,175,710	1,013,938	131,939	2,331,525	207,566	4,860,678	4,848,276	3,362*	165,526	4,679,388	‡470,599
Quincy, Omaha & Kansas City	262	453,230	175,487	680,664	173,377	119,185	15,504	318,975	29,843	656,884	23,780	.....	25,010	1,230†	16,884
St. Joseph & Grand Island	319	920,212	318,876	1,342,533	222,008	146,946	52,284	457,503	36,974	915,715	426,818	2,364	41,647	387,535	‡116,202
St. Louis, Brownsville & Mexico	454	666,892	326,051	1,060,325	173,905	128,622	29,826	379,801	55,303	767,457	292,868	618	43,361	250,125	60,022
St. Louis, Iron Mountain & Southern	2,608	14,117,653	3,797,580	19,573,638	2,773,562	2,709,648	443,974	6,481,952	599,859	13,008,995	6,564,643	23,368*	625,119	5,916,156	811,402
Southern Indiana	236	831,946	132,832	987,792	127,135	160,457	16,691	283,525	62,503	650,311	337,481	.....	69,285	268,196	‡170,358
Texas & New Orleans	450	2,071,066	699,760	2,962,048	539,818	431,448	59,772	1,225,575	82,571	2,339,184	622,864	3,982*	96,245	522,637	604
Texas Central	268	627,771	336,463	1,031,061	166,498	147,120	11,224	352,538	44,627	722,007	309,054	.....	25,197	283,857	52,128
Trinity & Brazos Valley	455	1,552,427	137,673	1,719,444	347 366	256,820	43,327	821,861	116,332	1,585,706	133,738	.....	31,399	102,339	506,056
West Jersey & Seashore	356	1,234,406	2,646,880	4,113,016	660,217	563,925	101,900	1,736,589	79,213	3,141,844	971,172	55,725	190,259	836,638	‡89,343
Western Maryland	543	4,066,734	668,925	4,959,890	540,571	730,013	69,620	1,609,563	122,125	3,071,892	1,887,998	.....	165,000	1,722,998	122,017
Wheeling & Lake Erie	442	3,947,042	410,830	4,639,577	506,045	1,110,987	59,281	1,636,931	147,953	3,461,197	1,178,380	21,509	216,396	983,493	257,653
Wisconsin, Minn. & Pacific	271	386,253	148,562	578,097	122,241	61,340	3,474	222,404	2,944	412,408	165,694	50	28,960	136,784	11,142

*Deficit. †Loss. ‡Decrease.

Summary of Monthly Reports of Revenues and Expenses of Railways for April.

Item.	1908 Amount.	1908 Mile of line.	1908 Ratio p. ct.	1909 Amount.	1909 Mile of line.	1909 Ratio p. ct.
Rail operations:						
Freight revenue	$114,340,089	$527	68	$131,464,249	$600	69
Pass'ger revenue	39,560,693	182	23	42,291,934	193	22
Other transp. rev.	13,194,200	60	8	14,151,285	64	7
Non-transport. rev.	1,521,855	7	1	1,708,271	7	1
Unclassified rev.	16,194	..	..	16,950	..	..
Total oper. revs.	$168,633,032	$777	100	$189,632,690	$866	100
Maint. way & strs.	$22,760,298	$104	13	$26,214,571	$119	14
Maint. of equipmt.	25,257,175	116	15	29,102,982	132	15
Traffic expenses	3,637,844	16	2	4,024,767	18	2
Transp. expenses	63,064,647	290	37	64,526,779	294	34
General expenses	4,850,964	22	3	5,077,770	23	3
Unclasified exp.	17,617	..	..	17,050	..	..
Total oper. exp.	$119,588,547	$551	71	$128,963,921	$589	68
Net oper. rev.	$49,044,485	$226	29	$60,668,769	$277	32
Outside operations:						
Total revenues	$2,881,951	$13	..	$4,044,139	$18	..
Total expenses	2,487,130	11	..	3,805,168	17	..
Net revenue	$394,821	1	..	$238,970	$1	..
Total net rev.	$49,439,306	$227	..	$60,907,739	$278	..
1-12th annual taxes.	6,856,860	31	..	7,050,766	32	..
Operating income.	$42,582,446	$196	..	$53,856,972	$246	..
No. of reports	731			770		
Mileage operated	216,947			218,935		

Car Surpluses and Shortages.

Arthur Hale, General Agent of the American Railway Association, says: "Bulletin No. 49 gives a summary of surpluses and shortages by groups from February 19, 1908, to June 2, 1909. The total for this report is 277,559, an increase of 3,669 since our last report. Box cars increased 5,661 and coal and gondolas 2,400; these increases being partially offset by decreases in surplus flats and miscellaneous. The results by groups were proportionate with the grand total excepting in group 4 (South Atlantic), which shows a considerable decrease, and group 6 (Northwestern), where the increase was the greatest."

The accompanying table gives the surpluses and shortages for the period covered by the report, and the chart shows surpluses and shortages for 1907, 1908 and 1909.

Car Surpluses and Shortages, February 19, 1908, to June 2, 1909, Inclusive.

	Number of roads.	Surpluses. Box.	Flat.	Coal, gondola and hopper.	Other kinds.	Total.	Shortages Box.	Flat.	Coal, gondola and hopper.	Other kinds.	Total.
June 9, 1909	161	123,918	12,865	99,406	41,370	277,559	170	51	5	59	285
May 26, 1909	158	118,257	14,940	97,006	43,687	273,890	83	99	1,011	47	1,240
May 12, 1909	158	113,601	16,574	105,684	48,620	284,479	78	4	22	83	187
April 28, 1909	161	107,665	16,487	110,538	47,638	282,328	144	106	74	173	497
March 31, 1909	158	101,344	20,428	128,546	46,282	296,600	158	98	116	27	399
February 17, 1909	159	98,512	23,924	135,208	43,797	301,441	266	97	11	96	470
January 20, 1909	162	127,204	26,723	116,680	41,057	311,664	163	21	139	35	358
December 23, 1908	158	87,350	16,247	79,595	38,885	222,077	471	42	289	217	1,019
November 25, 1908	160	45,194	12,157	43,854	31,624	132,829	7,923	178	900	209	9,210
October 28, 1908	158	39,383	10,185	31,541	29,803	110,912	8,175	167	2,261	236	10,839
September 30, 1908	160	42,593	10,365	49,795	31,039	133,792	7,313	450	224	127	8,114
August 19, 1908	160	106,367	13,494	92,500	40,642	253,003	465	90	105	194	854
July 22, 1908	166	120,580	14,401	125,739	47,960	308,680	115	37	330	27	509
June 24, 1908	163	123,112	18,042	130,149	41,995	313,298	266	34	120	31	451
May 27, 1908	160	144,697	20,075	162,695	54,437	381,904	82	13	12	18	125
April 29, 1908	159	147,971	24,350	186,742	59,542	413,605	145	42	16	64	267
March 18, 1908	160	103,509	25,122	119,205	49,206	297,042	533	151	250	73	1,007
February 19, 1908	161	113,776	30,088	134,217	44,432	322,513	697	141	249	162	1,249

STATE COMMISSIONS.

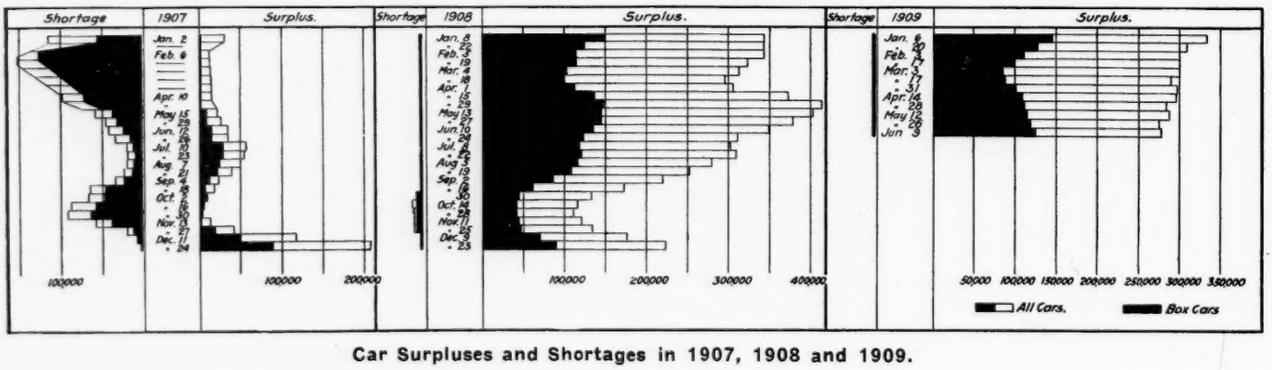
The Railroad Commission of Georgia has denied the petition of Beck & Gregg Hardware Co. to make a reduction in rates from seaports to Atlanta and other interior points on imported goods. The majority of the Commissioners hold that regulation of these rates would amount in effect to a regulation of interstate rates through a disturbance of the general rate fabric. Two of the five commissioners dissented.

The State Corporation Commission of Oklahoma has bought a gasolene motor car, capable of carrying six persons and of traveling on a railway track at 40 miles an hour, with which to make an inspection of the railways of that state, which are said to aggregate 5,695 miles. An engineer has been engaged to inspect the railways for the purpose of making an official valuation of their property, and he will use this car.

The State Railroad Commission of Texas has issued an order to the effect that logging railways will hereafter be recognized as common carriers, provided they are operated under charters duly filed with the Secretary of State. This change, if carried out, may add 400 miles to the railway record of the state, and will also put the logging roads in a position to make through joint rates with other railways.

The Indiana State Railroad Commission has received already a considerable number of complaints of infractions of the full-crew law, and proposes to forward these to the proper prosecuting officers of the counties in which the violations occurred. This plan was adopted on the receipt of the letter of the governor of the state criticising the action of the commission in deciding that trifling technical infractions ought not to be punished.

The State Railroad Commission of Louisiana has called upon the railways of the state to be more strict in posting bulletins at stations when trains are late, in keeping stations clean, in furnishing drinking water and in other matters con-



Car Surpluses and Shortages in 1907, 1908 and 1909.

cerning which the Commission has issued orders; and to advise the Commission what they are doing. The Commission takes this action because it has received complaints, yet the complainants have mentioned no specific cases.

The New York State Public Service Commission, First district, has denied the request of the New York Central for leave to close its station on the Harlem division at 183d street, New York City. This station, between Fordham and Tremont, was opened only a few years ago. The request for permission to abandon the station is based on a falling off in business, due presumably, to diversion of traffic to the street car lines. The real estate interests who assisted in building the station protested against its abandonment.

New York: Without Jurisdiction.

Railroad Improvement Association of Nyack v. Erie. Opinion by Commissioner Decker.

The service between New York, via Jersey City and the Bergen tunnels, and Nyack, N. Y., is complained of. The defendant claims that this service is limited by the capacity of the Bergen Hill tunnels and to increase this service would interfere with through business. The commission finds that it is without authority to issue an order in the case because, although originating and terminating in New York, the service passes through New Jersey and is therefore interstate commerce and subject to federal authority.

Nebraska: Comparative Rates on Grain and Flour.

Updike Milling Co. v. Union Pacific. Opinion by Chairman Clark.

The complaint charges that the defendant's rates on wheat are higher from certain points in Nebraska to Omaha than the rates on flour from the same points to Omaha. In some cases the difference is as much as 10 per cent. in favor of flour. Rates from other points in the state to Omaha are the same on flour and wheat or are higher on flour. The defendant does not satisfactorily explain how these rates that are complained of came to be adjusted, and the Commission decides that whatever may have been the original reason for charging more for the transportation of grain than for flour (and this reason apparently was to build up milling businesses at the different points where the low flour rate is charged) the reason no longer exists and orders that the rates on flour and grain be made the same.

COURT NEWS.

A jury in the federal court at Walla Walla, Wash., has awarded J. L. Dumas, of Columbia County, Washington, judgment for $6,750 damages for losses suffered by Dumas through the failure of the Oregon Railway & Navigation Co. to furnish him enough cars for the transportation of his apple crop in 1908. Dumas is the largest individual apple grower in Washington. He sued originally for $11,128 damages.

In the Federal court at Philadelphia, June 16, the Philadelphia & Reading was indicted by the grand jury for accepting freight at less than the published rates. The indictment has to do with shipments imported from Germany, on which the railway participated in through ocean and rail rates which had not been published. It is said that the government intends to prosecute the road on the ground that, in the eye of the law, Philadelphia, and not the European point, is the original shipping point.

In the Kentucky State Court of Appeals last week the Southern Pacific Company won its case in the suit in which the state sought to tax about $300,000,000 of stocks, bonds and other intangible property held by the company, which is incorporated under the laws of Kentucky, asserting that the situs of the property is in Kentucky. The court holds that only such property as represents investments on high seas, consisting of ships, etc., is taxable in that state. This amounts to about $8,000,000 and will be taxed one-half of 1 per cent. annually, beginning five years back, which tax the company will have to pay.

Railroad Officers.

ELECTIONS AND APPOINTMENTS.

Executive, Financial and Legal Officers.

Blewett Lee has been elected the General Solicitor of the Illinois Central, with office at Chicago, and the office of General Counsel has been abolished.

Operating Officers.

Charles F. Gary has been appointed an Assistant Trainmaster of the Missouri Pacific, with office at Fort Scott, Kan.

S. J. Jones has been appointed the Superintendent of Transportation of the Georgia, Florida & Alabama, with office at Bainbridge, Ga. The office of Master of Trains has been abolished.

W. C. Nixon, General Manager of the St. Louis & San Francisco, has not resigned nor has he any intention of resigning. This corrects an erroneous statement appearing in these columns last week.

George B. Beale, recently appointed Superintendent of the Buffalo division of the Pennsylvania, was born May 27, 1861. He graduated from the University of Pennsylvania in 1881 and began railway work in September of that year as rodman on the second-track extension of the Baltimore & Potomac of the Pennsylvania. In November the next year he was made levelman and transitman, and after having left the employ of the Pennsylvania in July, 1883, returned in February, 1884, as rodman on the Pittsburgh division. Two years later he was appointed Assistant Engineer of the New York division, and in 1889 was appointed Assistant Supervisor of subdivision A of the New York division. The next year he was promoted to Supervisor, and in 1894 was appointed Assistant Engineer of the Middle division of the Philadelphia & Erie. A year later he was made Assistant Engineer of the Middle division of the Pennsylvania, and in 1899 was transferred as Assistant Engineer to the New York division. In 1902 he was appointed Superintendent of the Bedford division, and in 1903 was transferred as Superintendent to the Chautauqua division, which position he held until June 1.

Traffic Officers.

H. D. Henvis has been appointed a Traveling Passenger Agent of the Erie, with office at Seattle, Wash.

C. M. Agnew has been appointed a Traveling Freight Agent of the Southern Railway, with office at Kansas City, Mo., succeeding P. B. Doddridge, resigned to accept service with another company.

C. A. De Saussure, Division Passenger Agent of the Southern Railway, has been appointed an Assistant General Passenger Agent, with office at Memphis, Tenn. C. C. Stewart succeeds Mr. De Saussure, with office at Memphis.

C. W. Strain has been appointed the General Passenger Agent of the St. Louis & San Francisco lines in northern Texas and Assistant General Passenger Agent of the lines from Houston, Tex., to New Orleans, La., with office at Beaumont, Tex.

E. F. Hollis has been appointed a General Agent, Freight department, of the St. Louis Southwestern, succeeding to the duties of J. E. Allen, Assistant General Freight Agent, resigned. The office of Assistant General Freight Agent has been abolished.

F. H. Smith, Soliciting Freight Agent of the Seaboard Air Line at Norfolk, Va., has been appointed a Contracting Freight Agent, with office at Norfolk, succeeding F. W. Elliott, resigned to accept service with another company. J. E. White succeeds Mr. Smith, with office at Norfolk.

T. P. Toland, Soliciting Freight Agent of the Seaboard Air Line at Jacksonville, Fla., has been appointed a Commercial

Agent, with office at Jacksonville, succeeding J. H. Peters, resigned, E. B. Freeman, Soliciting Freight Agent at Tampa, Fla., succeeds Mr. Toland, with office at Jacksonville, and E. C. Staley succeeds Mr. Freeman, with office at Tampa.

Effective July 1, the Grand Trunk will assume the supervision of the solicitation in the West of the traffic for the following fast freight lines: Commercial Express Line (via Erie), Grand Trunk Despatch (via West Shore), Lackawanna Grand Trunk Line (via D., L. & W.), Milwaukee & Michigan Line (via N. Y. C. & H. R.), Reading Despatch (via Lehigh Valley), National Despatch-Great Eastern Line (via Central Vermont, Boston & Maine and Maine Steamship Co.). The office of Manager of these lines is to be discontinued and the operation of these fast freight lines for the routing and handling of through freight eastbound and westbound will be continued under the direct supervision of the railways interested. Correspondence relating to the accounting affairs of these lines should be addressed to Ira W. Gantt, who has been appointed Treasurer pro tem, with office at 403 Main street, Buffalo, N. Y.

Frederick S. Holbrook, whose election as Chairman of the Official Classification Committee has been announced in these columns, was born September 25, 1864. He began railway work in 1881 as a clerk on the Ogdensburg & Lake Champlain, now part of the Rutland. In 1886 he was made chief clerk in the General Freight office at Ogdensburg, N. Y., and three years later was made agent for the Ogdensburg & Lake Champlain, the Central Vermont and the Canada Atlantic, with office at Rouse's Point, N. Y. In 1890 he became cashier of the Ogdensburg Transit Co., at Chicago, and in 1894 was made cashier of the Central Vermont with office at New York, serving at the same time as Commercial Agent. In February, 1900, he was appointed Assistant General Freight Agent of the West Shore (part of the New York Central & Hudson River), and a year later was made First Assistant General Freight Agent of the New York, New Haven & Hartford at Boston, and on July 15, 1901, was made General Freight Agent, with office at New Haven. On September 1, 1908, he was made Chairman of the Committee on Uniform Classification, with office at Chicago, and held this position until May 1, when he became Chairman of the Official Classification Committee, with office in New York.

H. C. Martin, Chief of Tariff Bureau of the Grand Trunk lines west of Detroit and St. Clair rivers, has been appointed the Second Assistant General Freight Agent, with office at Chicago, and placed in charge of Tariffs and Percentage divisions of lines west of Detroit and St. Clair rivers. He will report to Assistant General Freight Agent R. L. Burnap, Chicago. His former title has been abolished. Ira W. Gantt, Division Freight Agent at Toledo, Ohio, has been appointed an Assistant General Freight Agent, with office at Buffalo, N. Y., having charge of traffic from connecting railways at the Niagara frontier, from connecting railways from points south of the Michigan-Indiana state line destined to points east of the Detroit and St. Clair frontiers, and will also have supervision over commercial agencies at Buffalo, N. Y.; Toledo, Ohio; Cincinnati, Ohio; Pittsburgh, Pa., and Philadelphia. His former office has been abolished. H. E. Graves has been appointed a Commercial Agent, with office at Chicago. T. A. Chappell has been appointed an Assistant Commercial Agent, and C. F. Rogers an Assistant Commercial Agent, both with office at Chicago. Henry W. Ploss, Contracting Freight Agent at Milwaukee, Wis., has been appointed a Commercial Agent, with office at Milwaukee. Allan Wallace has been appointed a Commercial Agent, with office at Omaha, Neb. W. H. Spicer, A. J. Mullins and C. E. Wagner have been appointed Commercial Agents, with offices at Detroit, Mich., Grand Rapids and Saginaw respectively. These three offices are new. C. J. Haigh has been appointed a Commercial Agent, with office at Philadelphia. This is a new office. All of these appointments are effective July 1.

Engineering and Rolling Stock Officers.

William M. Saxton has been appointed the Master Mechanic of the North Coast Railroad, with office at Spokane, Wash.

C. H. Temple, Master Mechanic of the Central division of the Canadian Pacific, has been appointed Assistant Superintendent of Motive Power, with office at Winnipeg, Man.

M. F. McCarra has been appointed the General Foreman of the Kingsville shops of the St. Louis, Brownsville & Mexico, with office at Kingsville, Tex., succeeding A. J. Conrad, resigned.

C. Z. Moore has been appointed the Supervisor of Division No. 4, of the Philadelphia division of the Eastern Pennsylvania Division, of the Pennsylvania, with office at Middletown, Pa., succeeding R. L. Baird, granted leave of absence.

W. E. Fowler, Master Car Builder of the Canadian Pacific and a past President of the Master Car Builders' Association, has resigned on account of ill health. R. W. Burnett, Assistant Master Car Builder, Eastern Lines, succeeds Mr. Fowler.

F. J. Hemphill, Signal Supervisor of the Illinois division of the Chicago, Rock Island & Pacific, has been appointed the Signal Supervisor of the Choctaw and Southern districts, with office at El Reno, Okla., succeeding J. J. Evans, transferred. S. Miskelly succeeds Mr. Hemphill, with office at Rock Island, Ill. A. G. Nutting has been appointed the Acting Supervisor of the Central district west of Davenport, and of that part of the Des Moines Valley division between Des Moines, Iowa, and Sibley, with office at Des Moines.

M. E. Hamilton, whose appointment as General Air Brake Inspector of the Atchison, Topeka & Santa Fe was recently announced in these columns, was born October 20, 1870, at Marshall, Ill. After a common school education he began railway work as fireman on the Chicago, Kansas & Nebraska, now part of the Chicago, Burlington & Quincy. In June, 1888, he was made engineman, and in May of the next year he was made a brakeman. In October, 1889, he went to the Atchison, Topeka & Santa Fe as brakeman, and in September of the following year became a conductor. In September, 1891, he went to the Gulf, Colorado & Santa Fe as conductor. In November, 1900, he became engineman and later shop foreman on the Mexican Central. In 1903 he became shop foreman on the Galveston, Houston & Henderson. In October, 1903, he was appointed shop foreman of the Gulf, Colorado & Santa Fe, and in May, 1906, was appointed Air Brake Instructor on the Atchison, Topeka & Santa Fe, which office he held until June 1.

M. E. Hamilton.

Special Officers.

Colonel L. J. Polk, Traveling Freight Agent of the Gulf, Colorado & Santa Fe, has been appointed the General Agent for the several departments of the company, with jurisdiction over the entire line, and with office at Galveston, Tex.

OBITUARY.

Caleb J. Camp, formerly President of the Connecticut Western, now the Central New England, died at his home in Winsted, Conn., in the early part of the week.

It is said that the Mongyana Railway is about to build an extension from Sao Jose do Rio Preto, Brazil, to Santo Antonio da Barra, on the frontier of the State of Minas Geraes.

Railroad Construction.

New Incorporations, Surveys, Etc.

ADA TERMINAL.—An officer writes that a contract has been given to J. R. Alley and work is to be started at once on a terminal line from the Oklahoma Central into the city of Ada, Okla. D. Carter and G. W. Reder, of Pursell, may be addressed. (June 11, p. 1229.)

ARIZONA & COLORADO.—This road has been extended from Pearce, Ariz., southward 16.5 miles, to Blacks.

ATCHISON, TOPEKA & SANTA FE.—According to press reports, an amendment to the charter of the Pecos & Northern Texas has been approved and filed for record. The change of charter provides for the construction of about 550 miles in western Texas, as follows:

From Texico, N. Mex., near the eastern end of the Belen cut-off, southeast through Parmer, Bailey, Lamb, Hockley, Lubbock, Lynn, Garza, Scurry, Fisher, Nolan, Taylor and Coleman counties, to Coleman, about 300 miles, where connection is to be made with the Gulf, Colorado & Santa Fe. (June 18, p. 1328.)

From Canyon City, Tex., south through Randall, Swisher, Hale and Lubbock counties, to a connection with the Texico-Coleman line, 105 miles, in operation to Plainview. Contract let to Moore & Harris to complete the line to Lubbock, 47 miles. (May 21, p. 1099.)

Branch from Plainview, southeast through Hale, Floyd, Crosby and Dickens counties, about 70 miles.

Branch from a point on the Coleman line near the center of Lubbock county, west through Hockley and Cochran counties to the New Mexico state line, about 75 miles.

ATLANTIC COAST LINE.—On the third division, the Jacksonville-Newberry line has been extended from Wilcox, Fla., northwest to Perry, 57 miles. (March 19, p. 651.)

CANADIAN NORTHERN.—A large amount of work is said to be under way on this road between the Great Lakes and Winnipeg by a force of nearly 1,000 men. Between Fort William, Ont., and Fort Frances the line is being reballasted and the present steel will be replaced with 80 and 85-lb. rails. The grade from Kakabeka Falls to Slate will be greatly reduced, and Stanley hill will be cut off from the main line, but is to be taken in by the Duluth extension, which it is proposed to build in connection with the Duluth, Rainy Lake & Winnipeg.

In British Columbia four survey parties are said to be in the field on the section between Tete Jaune Cache and Vancouver. When complete surveys will have been made between the Yellowhead Pass and the mouth of the Fraser river by way of the Upper Fraser river to Tete Jaune Cache, and by Cranberry and Albreda lakes to the head waters of the North Thompson river, thence down the North Thompson river to Kamloops to the South Thompson river, following the river to the Fraser river at Lytton, thence along the Fraser river to the seaboard.

CANANEA, YAQUI RIVER & PACIFIC.—See Southern Pacific.

CHESTER, PERRYVILLE & STE. GENEVIEVE.—The Saline Valley Railroad has been extended from Tlapek, Mo., west to Coffman, two miles.

CHICAGO, MILWAUKEE & PUGET SOUND.—Through freight and passenger service was inaugurated June 15 to all points on the road. (May 28, p. 1144.)

CHICAGO, ROCK ISLAND & GULF.—An officer writes that on the cut-off being built under the name of the Tucumcari & Memphis from Amarillo, Tex., west to Tucumcari, Mex., 110 miles, work is under way on 53 miles to Tucumcari. Maximum grades will be $^{6}/_{10}$ per cent. and maximum curvature 3 deg. The J. A. Ware Construction Co., of St. Louis, Mo., has the contract. (May 14, p. 1051.)

COLORADO & SOUTHERN.—On the Northern division, the Clear Creek district has been extended from Silver Plume, Colo., south to Mount McClellan, 16 miles.

GRAND TRUNK.—Surveys are said to be made for a more convenient connection between the Midland line and the main line between Port Hope, Ont., and Cobourg. Nothing definite has yet been decided as to the location or construction.

GULF, COLORADO & SANTA FE.—See Atchison, Topeka & Santa Fe.

HOUSTON, FOSTORIA & NORTHERN.—Incorporated in Texas with $50,000 capital and headquarters at Fostoria. An officer writes that the plans call for a line from Midline, where connection is to be made with the Houston East & West Texas, north via Fostoria on the Gulf, Colorado & Santa Fe, and San Jacinto, to Cold Springs, thence west to a connection with the International & Great Northern, near Elmina, 50 miles. The line from Midline, north to San Jacinto, 19 miles, is to be opened for freight and passenger traffic on July 1, and the section from San Jacinto to Cold Springs, four miles, is to be opened about September 1. A large force is at work between Cold Springs and Elmina, from the latter place east, about 16 miles of narrow gage line is now built, with which a connection is shortly to be made, and the completed portion changed to standard gage. E. C. Smith, of Fostoria, is the contractor. Thos. S. Foster, Pres., Houston, and G. R. Wansbrough, Gen. Mgr., Fostoria.

HUDSON & MANHATTAN.—See an item regarding this company under General News.

INTERSTATE RAILWAY.—An officer writes that about 80 per cent. of the right-of-way has been secured and partial financial arrangements made to build from Kansas City, Mo., north via Dearborn to St. Joseph, 48½ miles. Contracts are to be let about June 30 or July 15. The maximum grade is to be 1 per cent. and the maximum curves 3 deg. E. D. Martin, V.-Pres., and T. P. Martin, Sec., room 735, New York Life building, Kansas City.

MILLER CREEK.—Organized in Kentucky to build a four-mile line, including a steel bridge on concrete piers, about 400 ft. long, over the Big Sandy river to Coal Fields, near Paintsville, Ky. Address L. L. Malone, Gen. Mgr. of the Consolidated Coal Company, Fairmont, W. Va.

MILWAUKEE WESTERN (ELECTRIC).—Press reports say that contract has been given to the Chapman Construction Company, Chicago, to build from Milwaukee, Wis., northwest to Beaverdam, 55 miles, with a branch from Sussex south to Waukesha, 10 miles. (Mar. 19, p. 655.)

MOUNT HOOD RAILROAD.—This company now has in operation 17 miles of line from the city of Hood River, Ore., south through the lower valley of the Hood river fruit district to Dee, at which place the Oregon Lumber Company is operating a large electric saw mill. The road is being extended from Dee to the upper Hood river valley, 5.6 miles. It is expected that the grade will be finished and ready for track laying about September 1. E. T. Johnson & Company, Portland, Ore., has the grading contract. J. W. West, Ch. Engr., Hood River.

NEW YORK CENTRAL & HUDSON RIVER.—The New York Public Service Commission, Second District, has issued an order authorizing the elimination of grade crossings in the village of Ossining, N. Y. The highways are to be carried over the railway tracks by bridges having a minimum clearance of 16 ft. from the top of the rail. A roadway from Broadway to Secor street is to be included in the work. The estimated cost is $220,000, the railways to pay one half, the state one quarter and the village one quarter.

An order has also been issued for the elimination of grade crossings on Dock street and Washington avenue, in Hastings-on-Hudson. Dock street is to be closed and a new street laid out. This includes building an overhead bridge 30 ft. wide over the tracks, 220 ft. north of the present Dock street crossing, to have a height of 16 ft. from the top of the rail. At Washington avenue a similar bridge is to be built over the railway tracks, to be approached from the east by a viaduct. The cost of improvements at Hastings-on-Hudson will be $118,300, to be apportioned as at Ossining. (Mar. 19, p. 656.)

A press despatch from Pittsburg says the New York Central & Hudson River is to build a line from Port Vue, a suburb of Pittsburgh, to Clymer, Pa., on the Pittsburgh & Clearfield division of the N. Y. C. & H. R., about 70 miles.

NEW YORK SUBWAYS.—See item on this subject under General News.

Oklahoma Roads.—The Ardmore Commercial Club has accepted the proposition of Oscar O. Ayres, representing C. F. Clarke & Co., of Philadelphia, Pa., to build a line to use steam or electricity as its motive power, from Ardmore, Okla., north through Springer, thence northwest along the south side of the Arbuckle mountains to Chichasha, about 80 miles. As soon as the line is in operation to a point three miles beyond Springer, where it is proposed to put up a cement plant, residents of Ardmore are to pay $25,000, and an additional $25,000 when the grading is finished to Chichasha. The towns of Duncan and Lawton are negotiating and offering inducements to have the line run through those towns. H. G. Spaulding, Sec., Ardmore Commercial Club, can give information.

Paris & Mount Pleasant.—Organized in Texas with $75,000 capital, to build from Paris southeast to Mount Pleasant, 50 miles. Location surveys are now being made, and much of the right-of-way and terminal facilities have been secured. R. F. Scott, Pres., Paris.

Pecos & Northern Texas.—See Atchison, Topeka & Santa Fe.

Pittsburg, Shawmut & Northern.—According to press reports, a contract has been given to the Miller Construction Company of Lock Haven, Pa., for building 11 miles of an extension in Pennsylvania. An officer writes that the only foundation for the above at present, is that the Receiver is building 12 miles between Coryville, Pa., and State Line.

Portland Railway, Light & Power Company.—An officer writes that the improvements to be made this year are only extensions of present city lines, the work being mostly short sections of track. (June 4, p. 1187.)

Quanah, Acme & Pacific.—Track laying is said to have been started on the extension building from Acme, Tex., southwesterly. (May 7, p. 1008.)

Saline Valley.—See Chester, Perryville & Ste. Genevieve.

Shaw & Southwestern.—Organized in Mississippi, with $50,000 capital, to build from Shaw, in Bolivar county, on the Yazoo & Mississippi Valley, southwesterly via Busey to Wilczinski, about 25 miles. The promoters include J. C. Walker and other local residents.

Southern Pacific (Mexico).—An extension of the Cananea, Yaqui River & Pacific has been opened for business from Cumuripa, Sonora, north to Tufanito, 18 miles. (March 19, p. 661.)

The Southern Pacific Railroad of Mexico is now open for business on the extension from Culiacan, Sin., south to Mazatlan, 137 miles. (April 30, p. 961.)

Southern Pacific Railroad of Mexico.—See Southern Pacific.

Southern Railway.—On the Murphy division, the Fontana branch has been opened for business from Bushnell, N. C., west to Fontana, 14 miles. (March 19, p. 658.)

Spokane & Inland Empire (Electric).—According to press reports this company is considering plans for a branch from the main line near Ochlare, Wash., east to Plummer, Idaho, 20 miles. (Jan. 8, p. 89.)

Toledo, Bowling Green & Southern Traction.—An officer writes regarding the report that an extension is to be built from Findlay, Ohio, south to Kenton, 30 miles, that nothing definite has been done. The company made a proposition to finance and build the line if the residents furnished the right-of-way.

Tucumcari & Memphis.—See Chicago, Rock Island & Gulf.

Valley Railroad.—Incorporated in Arkansas, with $100,000 capital, to build from Houston, Ark., on the Chicago, Rock Island & Pacific, southwest to Perryville, about 10 miles. The incorporators include J. E. Rose, A. F. Leigh, G. H. Brockingham, J. H. Bowen, J. L. Hill and S. V. Taylor.

Wisconsin & Northern.—An amendment to the charter has been filed permitting a change of route and building about 10 miles additional on the extension into Langlade and Forest counties, Wisconsin. A portion of the original survey is to be abandoned. (April 23, p. 918.)

Railroad Financial News.

Atchison, Topeka & Santa Fe.—At the close of business June 16, $15,406,000 of the outstanding $49,711,000 4 per cent. and $3,953,000 of the $26,056,000 5 per cent. convertible bonds had been exchanged for common stock. The total stock outstanding now amounts to $235,488,230, of which $114,173,730 is preferred and $121,314,500 common. Since stockholders have the right to subscribe to new convertible 4 per cent. bonds to the extent of 12 per cent. of their holdings of stock at the close of business June 16, the amount of bonds that they may subscribe to is $28,258,000 of the authorized issue of $65,000,000. (June 11, p. 1230.)

Central of Georgia.—The formal transfer of the $5,000,000 stock bought in 1907 by E. H. Harriman and held in a voting trust for two years by Oakleigh Thorne and Marston J. Perry has been made to the Illinois Central. Some time after the sale of the stock by Southern Railway interests to Mr. Harriman he stated that he was holding it in the interest of the Illinois Central.

Cincinnati, Hamilton & Dayton.—The Federal court has authorized Judson Harmon, receiver, to make an arrangement with the holders of receiver's certificates to extend the certificates until August 15. The interest due is to be paid July 1. The receiver's term of office has also been extended to August 1.

More than 95 per cent. of the $15,000,000 4½ per cent. notes have been deposited with the noteholders' protective committee, J. N. Wallace, chairman, and two-thirds of the depositors of the notes have consented to the reorganization plan. (June 4, p. 1188.)

Colorado & Northwestern.—See Denver, Boulder & Western.

Denver, Boulder & Western.—This company is the successor to the Colorado & Northwestern and, it is said, has made a mortgage securing $800,000 bonds, $700,000 of which are to be issued to pay for the property taken over and $100,000 to be issued to pay for extension, betterments and additional rolling stock. The line of the Colorado & Northwestern runs from Boulder, Colo., to Eldora, with branches making a total of 54 miles.

Erie.—The Public Service Commission, Second district, has been asked for authority to issue $1,000,000 general lien 4 per cent. bonds of 1895-1996. There are now outstanding $35,885,000 of these bonds in the hands of the public.

Florida East Coast.—It is understood that J. P. Morgan & Co. have formed a syndicate to underwrite $10,000,000 bonds of the Florida East Coast. It is reported that the bonds will bear interest at 4½ per cent. and mature in 50 years. The proceeds are to be used for refunding purposes. The company has about $5,000,000 three-year 6 per cent. notes secured by first mortgage bonds and due Aug. 10, 1910. It is understood that George W. Perkins, of the firm of J. P. Morgan & Co., is to be elected a director.

Greenbrier & Iron Mountain.—Press despatches say that H. L. Van Sickler and D. C. T. Davis have been appointed receivers. The line of this company runs from White Sulphur Springs north into Greenbrier county, 30 miles.

Illinois Central.—See Central of Georgia.

Kansas City, Mexico & Orient.—A. E. Stilwell, President, is offering at par, with bonus of 40 per cent. in common stock and 40 per cent. in preferred stock, $1,500,000 first mortgage 4 per cent. 50-year bonds.

Louisville & Nashville.—A semi-annual dividend of 3 per cent. on the $60,000,000 stock outstanding has been declared payable August 10. This compares with 2½ per cent. paid in February, 1909, and August, 1908, and 3 per cent. paid semi-annually previously since February, 1905.

Metropolitan Street Railway (New York).—The 4 per cent. refunding mortgage bondholders' committee, Edwin S. Marston, chairman, have sent out a circular to bondholders stating that in their opinion the Metropolitan Street Railway, which operates part of the surface railways in New York, under present conditions and laws is not able to

earn the interest on either the outstanding $12,500,000 5 per cent. general and collateral trust bonds or on the outstanding $16,604,000 4 per cent. refunding bonds. They suggest that unless present conditions and laws can be changed it may be to the interest of bondholders to sell the property directly subject to their lien and thus disrupt the street railway system of New York. A decree of foreclosure of the general and collateral trust mortgage securing the $12,500,000 5 per cent. bonds has been entered and the sale of the property has been fixed for November 15, 1909.

MISSISSIPPI CENTRAL.—Harvey Fisk & Sons, New York, are offering the unsold portion (about $1,500,000) of the present issue of $4,100,000 first mortgage 5 per cent. bonds of July 1, 1909-1949, principal and interest guaranteed by the United States Lumber Co. at 97½. The company acquired through consolidation the property of the Natchez & Eastern and owns and operates a line running from Natchez, Miss., to a point 14 miles southeast of Hattiesburg, Miss., 164 miles. A circular issued by the bankers describes the property and is accompanied by a map.

NATCHEZ & EASTERN.—See Mississippi Central.

Opportunities for Exporting Ties to France.

The French customs duty on ties in their natural state, not having been tarred or otherwise prepared, and imported direct from an American to a French port, is, on condition that they exceed 3.1496 inches in diameter, 19.3 cents per 220.46 lbs. gross. If the ties are imported into France via another European port or country, as, for instance, via London, Antwerp or Rotterdam, the foregoing rates are augmented by a surtax of 69.5 cents per 220.46 lbs. gross. Ties treated with tar, creosote or other substances pay the foregoing rates plus 20 per cent. The surtax, however, remains the same. Railway ties are among the comparatively few articles admitted from the United States into France under the minimum tariff. In reply to communications from a United States consular office to all the French railway companies, and to the leading contractors, inquiring whether they would be disposed at this time to purchase American ties, the following have been received: The Northern Railway (Chemin de Fer du Nord) replied that it would consider offers of unprepared beech and oak ties to be delivered free on cars, duty paid, either at Dunkirk, Calais, Boulogne or Rouen, but at no other ports. The other railway companies also insist on free delivery on cars, duty and other charges paid, at one of the points on their respective lines. The Paris-Lyon Mediterranean company says that it will not consider quotations exceeding $1.18 per tie. The French state railways, as a general rule, use only ties of domestic origin; but recently purchases have been made of Baltic redwood and Black Sea beech ties. The management attaches great importance to the place of origin of the species of wood supplied, and it should invariably be stated. Moreover, it will accept only wood which has been cut after the growing season, i.e., from October 15 to March 15. The wood must also be sound and free from all defects. Beech ties which cannot be easily injected or have red heartwood will be refused. The ties are usually treated with creosote, and occasionally with a mixture of creosote and chloride of zinc. Unprepared American ties would be acceptable. Stress is laid on the point that the dimensions of the ties and the species of wood of the present or coming campaign should be accurately described, and the prices quoted free on car at Havre, duty paid. Quotations may be given on a shipment of from 50,000 to 100,000 ties. The approximate age of the trees, the method of cutting the ties (two or four per log section), and the proportion and distribution of sapwood and heartwood in the section should also be stated. Should the offers appear to be advantageous the company would then request shippers to send them two or three ties as samples before giving an order. The French state railway management prefers for its soft-wood ties the species of pine trees (Pinus, Baltic redwood) to the species of fir trees (Abies vel picea excelsa, red pine or spruce fir), and it prizes more highly those in which sapwood predominates than those which have a greater quantity of heartwood.

Equipment and Supplies.

LOCOMOTIVE BUILDING.

The Houston, Fostoria & Northern is in the market for one locomotive.

The Texas Central has ordered, it is said, three 10-wheel passenger locomotives from the American Locomotive Co. This item is not confirmed.

The Canadian Pacific has ordered, it is said, one switch engine from its Angus shops, and 15 mixed traffic locomotives, D-10, from the Montreal Locomotive Works. This item has not been confirmed.

CAR BUILDING.

The Houston, Fostoria & Northern is in the market for 80 flat cars.

The Erie is figuring on 100 composite steel and wood passenger cars.

The Pullman Company is building for itself, for service on the Pennsylvania, 500 steel sleeping cars.

The Texas & New Orleans is said to be in the market for new equipment. This item has not been confirmed.

The Cienfuegos, Palmira & Cruces, electric, Cuba, is in the market for two 30-passenger motor cars. T. N. Motley & Co., 30 Church street, New York.

The Boston & Maine has ordered 50 coaches from the Laconia Car Company. Of these, eight will be vestibule type and 42 will have open platforms.

The Wells-Fargo Express Co. is in the market for 25 refrigerator cars, passenger equipped, with steel underframes, to be duplicates of the ten ordered last year from the American Car & Foundry Co.

The Lehigh Valley, as noted in the *Railroad Age Gazette* of May 21, has ordered 15 all-steel passenger coaches from the Standard Steel Car Co. They are to weigh 106,000 lbs. and measure 68 ft. 5½ in. long, 9 ft. 9¼ in. wide and 14 ft. $\frac{5}{16}$ in. high, over all.

The Western Pacific, reported in the *Railroad Age Gazette* of May 14 as being in the market for passenger cars, has ordered 40 baggage cars from the American Car & Foundry Co., 60 passenger cars from the Pullman Co., and a number of dining and buffet cars from the Barney & Smith Car Co.

The Pennsylvania, as noted in the *Railroad Age Gazette* of June 11, is asking bids on 214 steel passenger cars of the following classes:

71 "P-70" coaches.
78 "P-54" coaches.
15 "PB-70" combined cars.
18 "PB-54" combined cars.
5 "B-70" baggage cars.
27 "MS-60" postal carriage cars.

The St. Louis & San Francisco, as noted in the *Railroad Age Gazette* of June 11, has ordered 250 fifty-ton steel underframe oil tank cars from the American Car & Foundry Co. They have a capacity of 10,000 gallons. The tank measures 28 ft. long and the frame 7 ft. 8½ in. wide inside, and the tank 33 ft. long and the frame 8 ft. ½ in. wide over all. The special equipment includes the following:

Axles	M. C. B. 100,000-lb. standard
Bolsters, body	Steel
Bolsters, truck	Cast steel
Couplers	Latrobe, 5 in. x 7 in. shank
Draft gear	Cardwell type-D friction
Trucks	Railroad standard
Wheels	Cast iron

IRON AND STEEL.

The Chicago & Alton is in the market for 10,000 angle bars.

The Texas & New Orleans is said to be in the market for rails.

The Iowa Central has ordered 3,000 tons of rails from the Indiana Steel Co.

The Chesapeake & Ohio has ordered 4,300 tons of rails from the Indiana Steel Co.

The Minneapolis & St. Louis has ordered 4,200 tons of rails from the Indiana Steel Co.

The Cienfuegos, Palmira & Cruces (Electric), Cuba, recently closed a contract with the U. S. Steel Corporation for 5,000 tons of rails.

The Chicago, Milwaukee & St. Paul is in the market for about 12,000 tons of structural steel for bridges in Wisconsin, Idaho and Montana.

The North Coast has ordered 7,500 tons of rails from the Colorado Fuel & Iron Co. for immediate use on its Yakima Valley line between the Columbia river and North Yakima, Wash.

The Rock Island Southern (Electric) has given the contract for the Cedar Creek bridge north of Monmouth, Ill., to the Wisconsin Bridge & Iron Works, involving about 185 tons of structural steel.

The Northern Pacific has divided an order for 25,000 tons of rails between the Indiana Steel Co. and the Lackawanna Steel Co. This is in addition to the 15,000 tons reported in the *Railroad Age Gazette* of June 18.

General Conditions in Steel.—Prices on steel have tended to become firmer and a representative of one of the large steel companies is quoted as saying that it is now certain that the price of standard section rails will remain unchanged at $28 a ton. Steel conditions are improving gradually and the upward trend seems likely to continue. The fact that railways are ordering equipment more freely is regarded as the best indication of future betterment. Charles M. Schwab, president of the Bethlehem Steel Corporation, who returned from Europe Tuesday, says regarding the steel situation: "All the blast furnaces and steel plants of the Bethlehem Steel Corporation, with the exception of the ordnance works, are in full operation. I have not been in the country long enough to make a definite statement as to steel conditions. However, from what I have heard, the steel industry is improving and will continue to improve."

RAILROAD STRUCTURES.

Arnprior, Ont.—Bids are wanted up to July 3 by Macallum & McAlister, Continental Life building, Toronto, for a steel bridge on concrete piers and abutments.

Chicago.—The Chicago & North Western has given a contract for its new power house to the George A. Fuller Co., Chicago.

Clovis, N. Mex.—The Wells-Fargo Express Co. is having plans made for a one-story stone and brick combined station and office building, 30 ft. x 55 ft., on Santa Fe right of way.

Hastings-on-Hudson, N. Y.—See New York Central & Hudson River under Railroad Construction.

Houghton, Mich.—The Mineral Range will build a viaduct connecting its properties, and other improvements are to be made later.

Kansas City, Mo.—The Wells-Fargo Express Co. is having plans made for two four-story buildings 100 ft. x 200 ft., to be used as a warehouse and stable.

Marcus, Wash.—The Great Northern will build a roundhouse, turntable and additional tracks.

Milwaukee, Wis.—The Milwaukee Electric Railway & Light Co. is said to have started grading work on a site of 33 acres on McKinley boulevard, from Thirty-fifth to Fortieth streets, preparatory to constructing car shops, yards and repair works. The shops will not be completed for several years. (Dec. 4, p. 1503.)

An ordinance has been introduced providing for the purchase by the city of land bounded by Wells, Cedar, Fifth and Sixth streets as a site for a union interurban railway station, to cost $100,000. (Dec. 4, p. 1503.)

The Chicago, Milwaukee & St. Paul, it is understood, will build a new passenger station at Lincoln avenue, in Bay View, to replace the present station at Becher street. Construction work is to be commenced as soon as the track elevation is completed.

See Chicago, Milwaukee & St. Paul under Iron and Steel.

Monmouth, Ill.—See Rock Island Southern under Iron and Steel.

Montreal, Que.—The Canadian Pacific will pay $6,000 towards the reconstruction of the bridge over St. Catherine street east if certain pillars supporting the bridge shall be built so as to give the company more room for its tracks at that point.

Muskogee, Okla.—The Wells-Fargo Express Co. is building a frame combined station and office building 24 ft. x 35 ft. on Midland Valley right of way.

New Orleans, La.—An officer of the Texas & Pacific writes that an arrangement for using the Illinois Central passenger station has been made and the company will not build a passenger station in New Orleans at the present time. (June 11, p. 1232.)

An officer of the Illinois Central writes, regarding freight terminals to be put up at New Orleans, that the company has bought property and introduced an ordinance which, if carried, will call for spending a large amount of money for freight and terminal facilities. No definite plans have been prepared pending the passage of the ordinance.

Oklahoma City, Okla.—The Wells-Fargo Express Co. is having plans made for a two-story combined station and office building 50 ft. x 100 ft. on Santa Fe right of way.

Ossining, N. Y.—See New York Central & Hudson River under Railroad Construction.

Quebec, Que.—The Quebec Bridge Commission, it is understood, has decided to erect the new bridge on the same site as the old bridge which collapsed during construction. It is expected the plans will be finished early in July. (June 11, p. 1233.)

San Antonio, Texas.—The Wells-Fargo Express Co. is building a brick combined station and office building 50 ft. x 70 ft. on the Galveston, Harrisburg & San Antonio right of way.

Windsor, Ont.—The Michigan Central will begin work early in July on the construction of a 20-stall roundhouse and a passenger station.

Winnipeg, Man.—Contract is to be let to Davidson Brothers, of Winnipeg, for putting up 47 stations at various points on the National Transcontinental (Grand Trunk Pacific) between Winnipeg, Man., and Lake Superior junction.

Woodward, Okla.—The Wells-Fargo Express Co. will build a combined station and office building 24 ft. x 45 ft. on Santa Fe right of way.

The consumption of railway ties in France averages 14,126,400 cu. ft. annually. Oak, beech and pine are the only species of wood used for this purpose, and the supply has been in recent years entirely of domestic origin. France imports considerable quantities of railway ties, as shown by the following figures for the years 1906, 1907 and 1908: 17,438 tons, 20,026 tons and 23,854 tons, respectively. The ties used in France are as a general rule treated with creosote or sulphate of copper, but a large proportion are laid without having undergone any special treatment. In most cases the railway companies contract for ties in their natural state and have them treated under the supervision of their own engineers. The most usual dimensions are the following: Length, 8 ft. 7 in.; width, 10 in.; thickness, 5½ in.; but the specifications vary somewhat with the different companies. The editor of the *Timber Trades Journal* states that the Paris-Lyon-Mediterranean Railway purchased their supply for the year on the basis of 86.8 cents each for oak ties and 67.5 cents each for beech ties.

Supply Trade News.

The Illinois Malleable Iron Co., Chicago, Ill., has increased its capital stock from $452,900 to $1,500,000.

The combination pressure and vapor heating system of the Gold Car Heating & Lighting Co., New York, has been specified for the 15 coaches ordered by the Lehigh Valley.

The A. B. C. Train Operating Co., Chicago, Ill., has been incorporated, with a capital stock of $100,000. The incorporators are: George Heidman, Norman A. Street and E. Kernwein.

The Tientsin-Pukow Railway of China is asking sealed bids for supplying 8,500 prime quality Oregon pine ties, bids to be closed on July 15. (United States Bureau of Manufactures.)

The Safety Lock & Signal Co., Kansas City, Mo., has been incorporated with a capital stock of $75,000. The incorporators are: Frank B. Dolsen, H. A. Humphrey and Walter L. Lumpkin.

The Jones & Laughlin Steel Co., Pittsburgh, Pa., bought coal lands recently in Washington county, Pa., valued at $4,000,000. This purchase was to insure a supply of coal and coke for the new Jones & Laughlin plants at Aliquippa.

The Jones & Laughlin Steel Co., Pittsburgh, Pa., has notified its employees that since June 1 their wages have been raised 10 per cent. This restores the wage scale that was in effect previous to April, when a 10 per cent. reduction was made.

The Armstrong Spark Arrester Co., Cincinnati, Ohio, has recently been incorporated with a capital stock of $100,000. The incorporators are: C. C. Armstrong, Albion F. McCarthy, Albert H. Morrill, L. A. Branse, John Rhonda and George T. Welsh.

The Hanlon Locomotive Sander Co., Winchester, Mass., announces that the Hanlon sander has been specified on the 71 engines now being built by the American Locomotive Co. for the New York Central Lines and on the 50 for the Boston & Maine, which are also being built by the American Locomotive Co.

The Atlas Locomotive Ashpan Co., Ft. Wayne, Ind., the incorporation of which was announced in the *Railroad Age Gazette* of June 11, will have its main office at 1011 Rockhill street, Ft. Wayne, Ind. The officers of the company are as follows: J. A. Swartz, President; T. P. Whelan, Secretary and Treasurer; N. C. Myers, Vice-President.

TRADE PUBLICATIONS.

Chicago & North Western.—The company is distributing a pamphlet giving a list of the national conventions in the west and northwest with dates and places of meeting and information on railway fares.

Fuel Reference Tables.—Tate, Jones & Co., Inc., General Offices, Pittsburgh, Pa. have just issued through their advertising department some valuable "Ready Reference Tables" for those using natural gas as a fuel. The tables are compiled in pamphlet form, which is being distributed gratis to those interested.

Rolled Steel Wheels.—An attractive and well illustrated catalogue, published by the Standard Steel Works Co., Philadelphia, has just been issued. It describes and illustrates the various types and sizes of wheels made by this company and also gives illustrations of various cars and locomotives fitted with "standard" rolled wheels. Drawings of axles and quite full axle data are a part of the catalogue.

El Tovar Hotel.—This hotel, under the management of Fred Harvey, of Atchison, Topeka & Santa Fe fame, is described in a most interesting fashion in a little booklet published by Fred Harvey. The hotel is situated on the rim of the Grand Canyon, Arizona, and the illustrations in the booklet showing the hotel and surrounding country are particularly charming. The pages are also decorated with sketches of western and Indian life.

The Boston & Maine has published a pamphlet of 132 pages describing New Hampshire and its business opportunities. The towns and cities of New Hampshire are taken up separately and the physical characteristics of each are described and the business and manufacturing opportunities in each are concisely given. The publication is a mine of information for any one who is interested either in a business way or for other reasons in New Hampshire.

Denver & Rio Grande.—A folder has been issued containing information regarding Denver, Colo., with illustrations and descriptions of nearby resorts and scenic attractions and information regarding railway fares. There is also a map of the central portion of the city of Denver and a map of the Denver & Rio Grande lines. The company is also distributing a beautiful illustrated pamphlet describing the wonderful thousand mile tour through the Rocky Mountains.

Rockwell Furnaces.—The Rockwell Furnace Co., with office at 26 Cortlandt street, New York City, and factory at Jersey City, has issued a pamphlet 16¼ in. x 11 in., containing 63 finely printed half-tone views of all sorts of installations of the oil, coal and gas furnaces made by the company. Apparently every imaginable use of small and moderate sized furnaces is here illustrated, and the pictures alone afford the reader a good course of instruction in melting, annealing and other heating processes.

Chicago & North Western.—The 1909 tourists' guide to the summer resorts and fishing and hunting grounds reached by the North Western is a handsome publication. It contains 13 full-page maps of various sections of this region, and a key map in the front, giving the locations of the sections covered by the large-scale maps. The letter-press is in colors and is surrounded with marginal half-tone and pen-and-ink illustrations. Information covering the summer trains, and a complete list of hotels, with their locations, rates, capacity, etc., are given.

Alaska-Yukon-Pacific Exposition.—The American Locomotive Co., New York, in pamphlet No. 10,035, illustrates and describes the joint exhibit of that company and the Atlantic Equipment Company, New York, at the exposition now in progress at Seattle, Wash. The exhibit consists of a rotary snow plow, built for the C. M. & P. S.; two locomotives, representing new standard designs; one 6-coupled tank locomotive for logging service; a four-wheel saddle tank contractor's locomotive; an electric motor and trailer built for the Southern Pacific Company, and the new model Atlantic steam shovel.

Lightning Arresters.—The General Electric Co., New York, has recently issued Bulletin No. 4663, covering lightning arresters, for both alternating and direct-current circuits. The lightning arresters described were designed after careful consideration of the great variety of conditions and phenomena produced by lightning, including all effects of abnormal voltage. These arresters, designed upon an elaboration by Prof. Elihu Thomson's fundamental patents, consist of a series of spark gaps shunted by graded resistances, but without series resistance. The bulletin gives detailed information with regard to the construction and design of the various types of multigap arresters, together with curves, illustrations, dimensions and connections. These cover not only the arresters, but also the auxiliary apparatus, including disconnecting switches, choke coils, horn gaps, etc. The bulletin also covers lightning arresters for direct-current service.

The Use of True Refined Linseed Oil to Protect Iron and Steel.

BY JAMES TODD.

Linseed is undoubtedly the best oil of which to make a paint, but unfortunately in the condition in which it comes from the crusher it contains a large proportion of acid and mucilaginous materials which are soluble in water. On exposure these dissolve out of the coating, and, of course, leave it pitted with flaws through which water and air enter; and then corrosion begins. These impurities in an unadulterated oil come principally from two sources, the harvesting of foreign seeds with the flax and from the flax itself, by reason of the powerful presses used by the crusher developing heat. The complaint that it is

impossible to get as good linseed oil as was ordinarily obtainable a generation or more ago is because in those days the crushing was done with comparatively light power and the seed was pressed cold. Now the seed is heated with steam and subjected to tremendous pressure, and the result is that the yield of oil from a given amount of seed is greatly increased, but in wringing the last particles of oil from the seed a quantity of mucilaginous matter comes with it, and consequently we have an ever increasing trouble from irregularities and porosity in ordinary linseed oil.

These impurities detract from the value of the oil as their non-drying character prevents the proper and thorough drying of the paint; but what is more serious is the fact that they are soluble in water and naturally dissolve out of the coating and leave breaks and flaws through which destructive agents enter and bring about disastrous results. The ordinary refined oils offered for sale are merely boiled, or air blown, or else are chemically treated and are not to be taken seriously. In considering such it is only necessary to know that the impurities which should be removed often amount to 20 per cent. of the bulk and that such refined oils are generally sold for from two to five cents a gallon above the price of ordinary oil. But if a true refined oil alone is used all porosity and solubility are gone and the result is an impervious and elastic coating of paint which will remain good for years after an ordinary paint has practically become useless.

Oscillating Measuring Chute for Locomotive Coaling Pockets.

Several recent installations of locomotive coaling pockets have been equipped with a new type of "Hunt" measuring chutes and valves. The illustration (Fig. 1) shows a pocket as installed for the Pennsylvania Railroad, at Greenville, N. J., and equipped with an oscillating "Hunt" measuring chute and valve, in order that the coal might be drawn from the pocket and loaded into the locomotive tender with an accurate knowledge of the quantity of coal thus used. The measuring chute is supported by hangers bolted on stringers on the under side of the pocket and placed in such a position that when the chute is in a horizontal position the coal flows from the pocket into the measuring chute, filling it entirely with coal.

When it is desired to fill the locomotive tender, the measuring chute is tilted from its horizontal plane to an inclined plane of say 45 deg., and the coal flows from the chute into the locomotive tender.

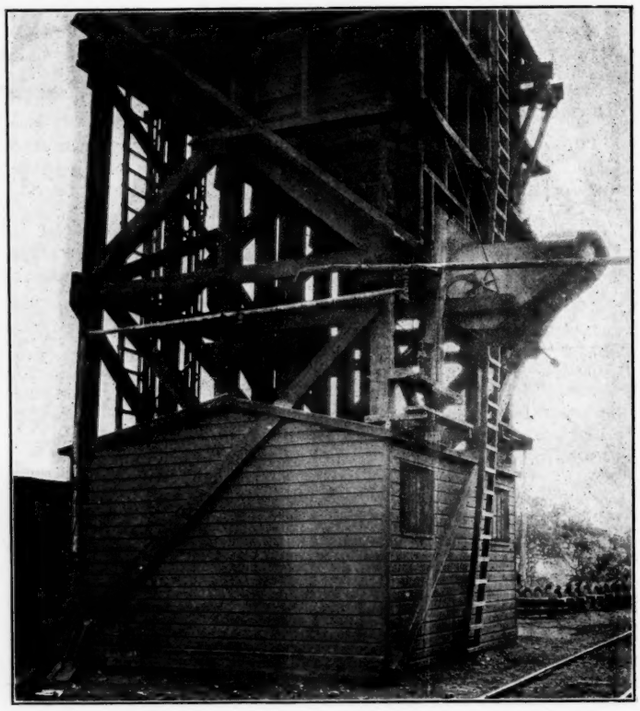


Fig. 1—Hunt Measuring Chute on Coaling Pocket.

When the chute is moved from its horizontal position, the coal outlet of the coaling pocket is automatically closed by the body of the measuring chute, thus preventing any spilling of coal.

The chute as here illustrated has a capacity of one ton of coal, and is operated by means of compressed air as the time element at this coaling pocket is an important factor.

The illustration (Fig. 2) shows another adaptation of this measuring chute and valve, as installed at the locomotive coaling pockets of the Chesapeake & Ohio at the Fulton yards, Richmond, Va. This pocket is divided into compartments for sand and coal, and the arrangement is such that six locomotives may simultaneously be furnished with the sand and coal required. From experiments made at these pockets, the coal, by means of the measuring chute and valve, is measured with accuracy. It was found that on taking an average weight of several loads that the weight was remarkably close to the scale weight.

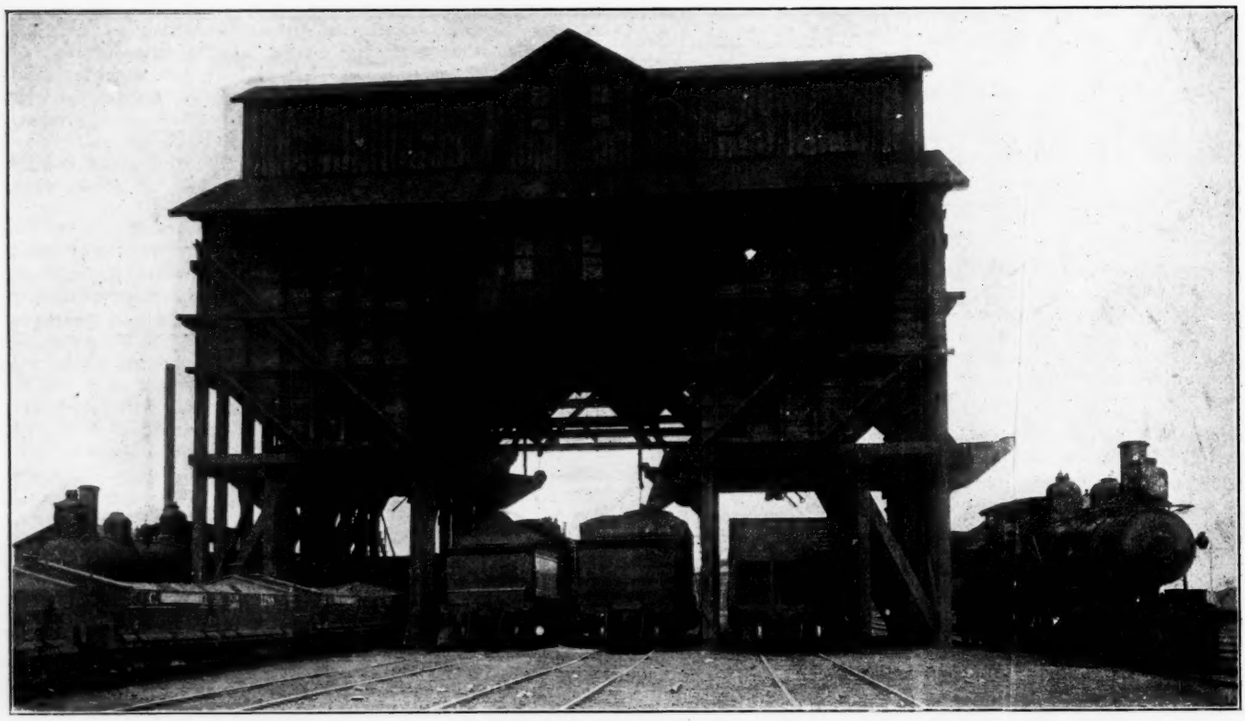


Fig. 2—Hunt Measuring Chute. Chesapeake & Ohio Yards, Richmond, Va.

These chutes are furnished and installed by the C. W. Hunt Company, 45 Broadway, New York City.